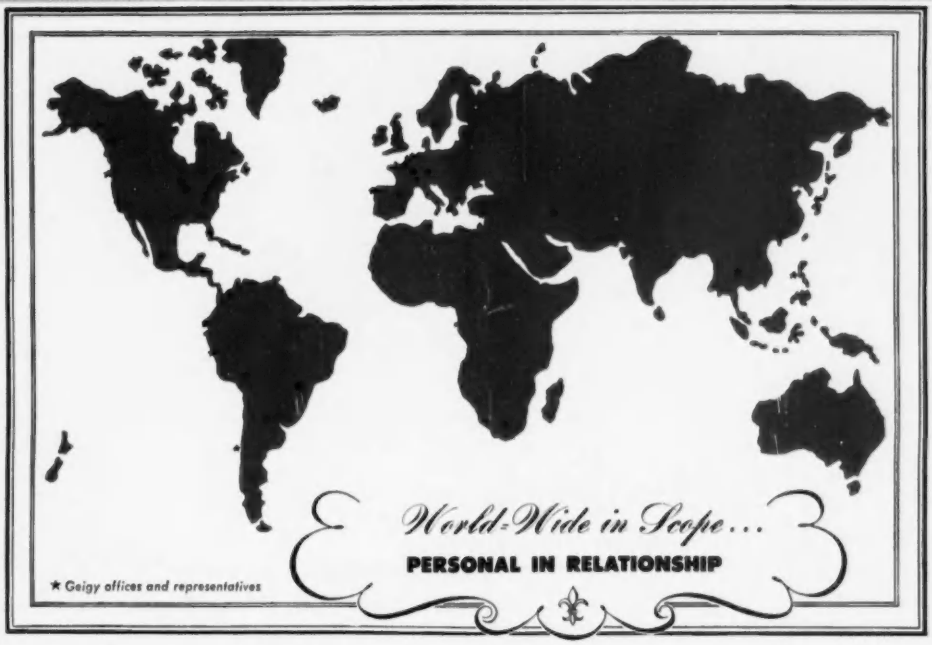
- What You Should Know About Continuous Cooking
- How to Get Rid of Curl in Board
- Today's Waste Paper Outlook

PAPER TRADE JOURNAL

March 26, 1954



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in coating formulas

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of the nation's leading producers of coated papers choose Calgon for their coating formulas

No wonder so many top producers of coated papers use Calgon in their coating colors. Its superior deflocculating properties has established Calgon as first choice wherever high quality and greater efficiency are wanted. Calgon leads because it provides . . .

BETTER PIGMENT DISPERSION. Calgon's efficiency as a dispersive of clay, titanium dioxide, precipitated calcium carbonate and other pigments result in better finished coated stock.

BETTER COATING COLORS. Coating colors are superior when Calgon is used because of improved flow properties and because higher solids can be used.

BETTER SURFACE COATINGS. Calgon in the formula greatly improves the bond between the coating and the paper stock.

Calgon can help in many other ways. If you have a specific problem, Calgon Technical Service stands ready to assist you in finding a solution. Tell us about your problem, or write for a copy of "Calgon and its Applications in the Pulp and Paper Industry."

HAGAN HALL BUROMIN CALGON

CALGON inc.

A SUBSIDIARY OF HAGAN CORPORATION
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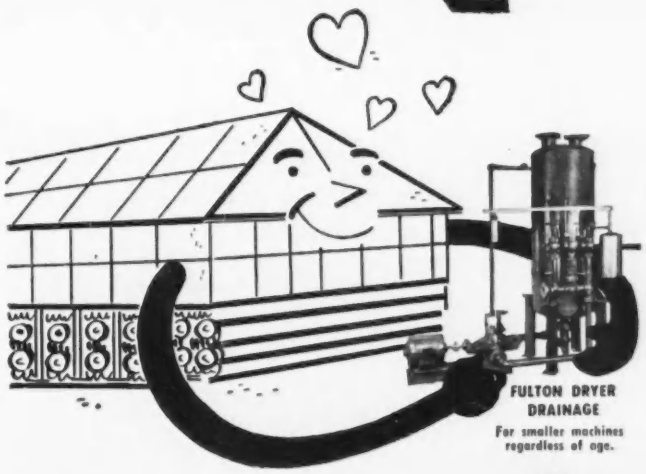
*T.M. Reg. U.S. Pat. Off.

THE Rebirth OF OLD NO. 1



Old No. 1 is up in years, slow and sluggish. Quality is off. Tonnage is off. Profit margins are too close for comfort.

Machine too old? Not necessarily. Too small? Not necessarily. Chances are about 10 to 1 that the bulk of the trouble lurks in the dryer section.

Faulty drainage makes for slow drying and lower tonnages. Faulty drainage causes uneven drying, cockling, curling. And a low output of less marketable grades makes for higher costs, stiffer competition and less in the bank.

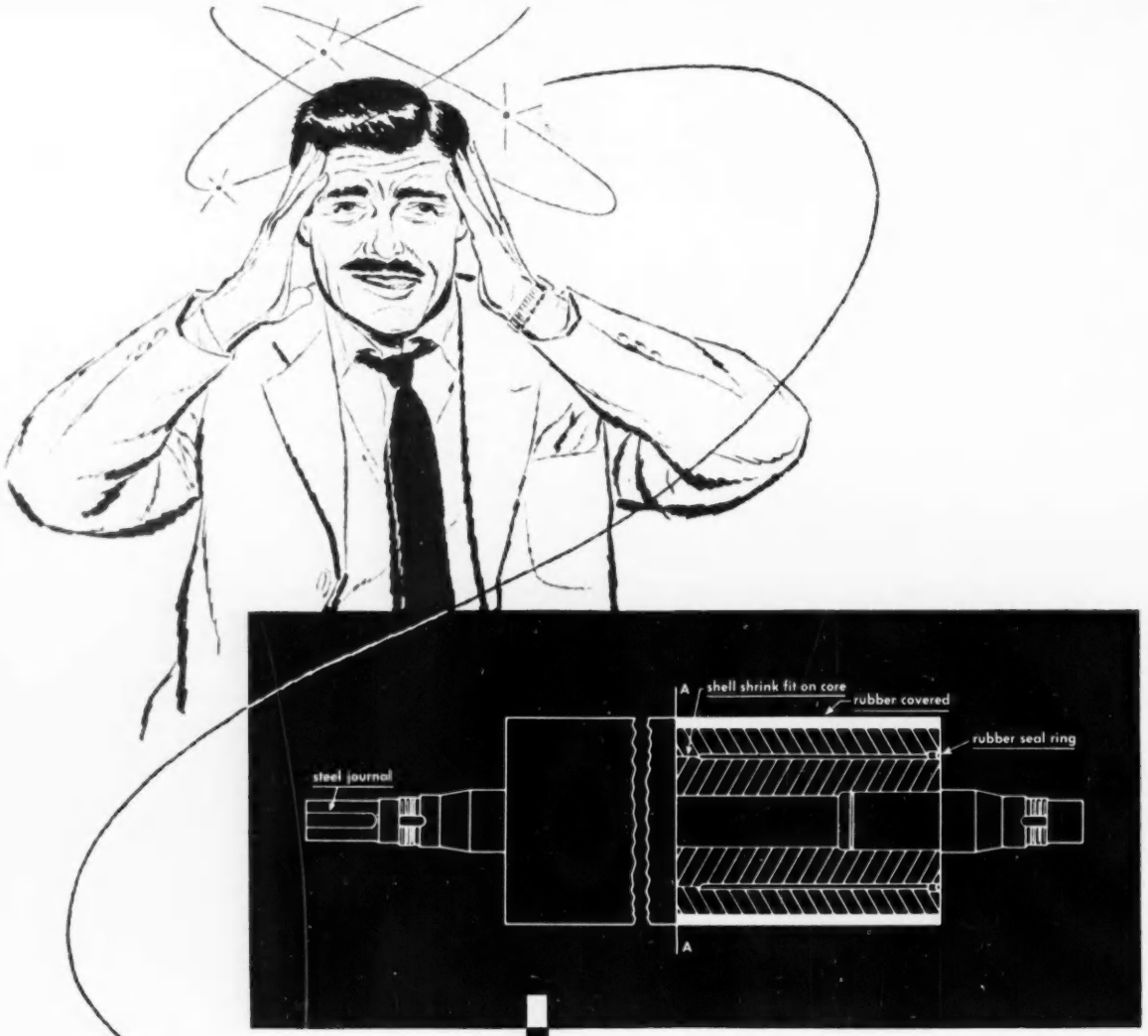
What to do? There is just one way out—just one. Snap up the machine production with a Fulton Dryer Drainage System.

Fulton Dryer Drainage removes condensate and air continuously, resulting in the highest possible dryer surface temperatures consistent with the steam pressures used.

Fulton Dryer Drainage provides the most effective dryer curve from lead-on dryer clear on through to the last dry and dryer.

Faster drying. Better drying. Less steam. Better profits. Those are the benefits. Close to 900 Fulton Dryer Drainage systems in service. Cost? Not enough to stop the mill that investigates.

THE MIDWEST-FULTON MACHINE CO.
DAYTON, OHIO



eliminate the headaches

Since time immemorial the necessity of crowning press rolls and varying the crown as the anticipated pressures vary has been a headache—and costly. With the B-C crownless roll there is no crown required. The above drawing explains all.

Already a substantial list of mills have adopted this new type roll. The new board machine built for Manchester Board and Paper Co., Richmond, Va., is the first machine completely equipped with crownless press rolls. There, all plain primary and main presses have them.

Here is something quite revolutionary—and good—not to be overlooked.

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SUBSCRIPTIONS

U. S. $5.00 per year to pulp and paper mill personnel, others $7.50. U. S. Possessions and Canada $7.00. Latin American Countries $15.00, all others $20.00. Single copies of regular editions are 25c.

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REMEMBER THESE DATES

MAR. 29-30-31: Annual Meeting, National Paper Trade Assn., Waldorf-Astoria Hotel, New York City.

MAY 20-22: Joint Spring Meeting, Pacific Section, TAPPI, Pacific Coast Div., APPMSA, Gearhart Hotel, Gearhart, Oregon.

MAY 23-25: Spring Meeting, National Paperboard Assn., Grove Park Inn, Asheville, N. C.

May 24-26: TAPPI Coating Conference, Poland Spring House, Poland Springs, Maine.

June 10-12: Spring Meeting TAPPI Empire State, Whiteface Inn, Saranac Lake, N. Y.

JUNE 14-17: Summer Meeting, Technical Section C.P.P.A., Empress Hotel, Victoria, B.C., Canada.

JUNE 21-23: National Meeting American Pulp and Paper Mill Superintendents Assn., Sheraton-Mount Royal Hotel, Montreal, Que.

PAPER TRADE JOURNAL

Published Weekly Since 1872

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A veteran boardmaker reveals what long experience has taught him.

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LOCKWOOD TRADE JOURNAL CO., INC., 15 W. Forty-Seventh St., N.Y. 36

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GEORGE E. LOCKWOOD, President and Treasurer
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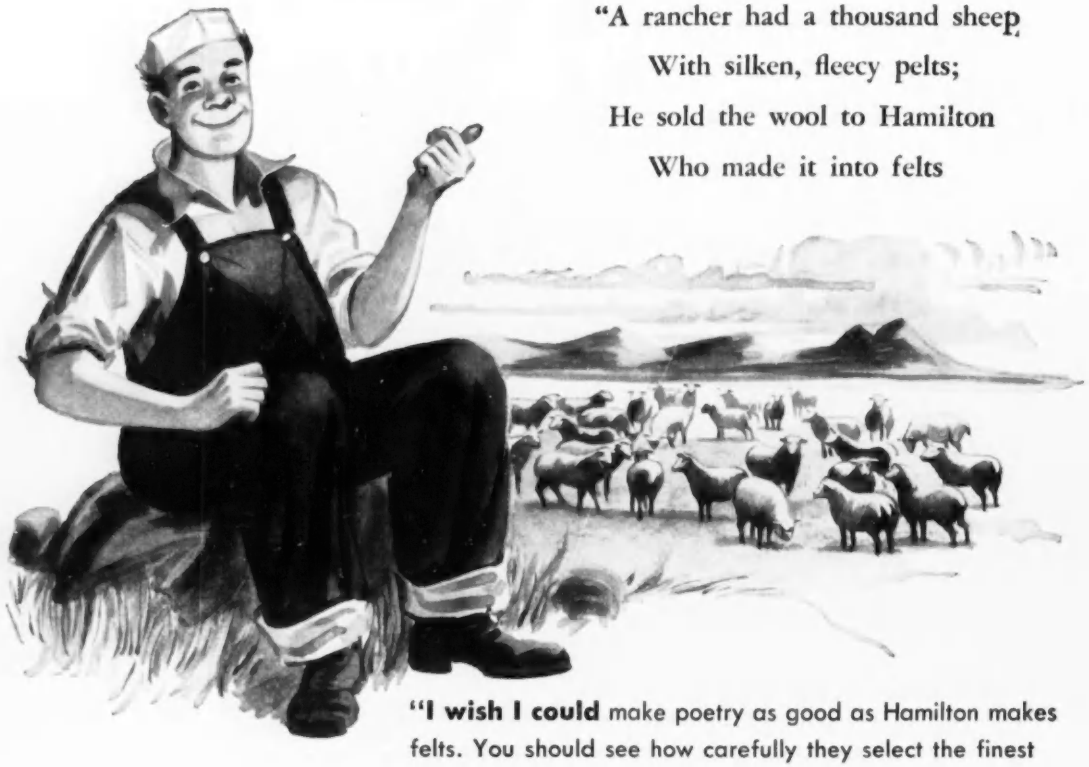
HAM FELTZ says:



"A rancher had a thousand sheep
With silken, fleecy pelts;
He sold the wool to Hamilton
Who made it into felts

"I wish I could make poetry as good as Hamilton makes felts. You should see how carefully they select the finest wool—how they remove all burrs—how thoroughly they wash them until they really are as white as snow.

"The carding takes out every kink and reduces the wool to a web no thicker than a spiderweb, before it is spun into yarn and woven into Hamilton Felts.

"No wonder manufacturers of paper and board prefer Hamilton Felts! Longer life at higher speeds—larger open spaces between threads to let water out without clogging—pre-shrunk to fit your machine without tearing down or break-in. And the thick nap that leaves no felt marks."

Hamilton Felts

With more than 300 styles of Hamilton Felts from which to select, you can always get the particular weave that will do your work better, faster and at lower cost.

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A NEW HEADBOX ADDITIVE

A CATIONIC STARCH DERIVATIVE

CATO STARCH is based on a new cationic derivative of starch for wet end addition on the paper machine. It meets the desired requirements of an internal starch additive. Due to the greater affinity of **CATO STARCH** to cellulose fibers, greater starch retention is obtained with stronger fiber bonding properties.

greater

PLUS EXCELLENT RETENTION OF FILLERS

strength

CATO STARCH improves strength factors such as mullen, pick, fold, tensile, etc., at low concentrations.

CATO STARCH offers excellent retention of fillers and pigments such as clay, titanium dioxide, calcium carbonate, etc.

CATO STARCH drains freely on the paper machine, often permitting increased machine speed without loss in strength.

CATO STARCH improves formation and finish of many papers.

CATO STARCH is applicable to paper and board ranging from high grade book and writing paper to kraft liners. Also many types of pulps and brokes.

Our Paper Technical Service is prepared to offer technical assistance in mill evaluations of **CATO STARCH.** For further information write: National Starch Products Inc., 270 Madison Avenue, New York 16, N. Y.

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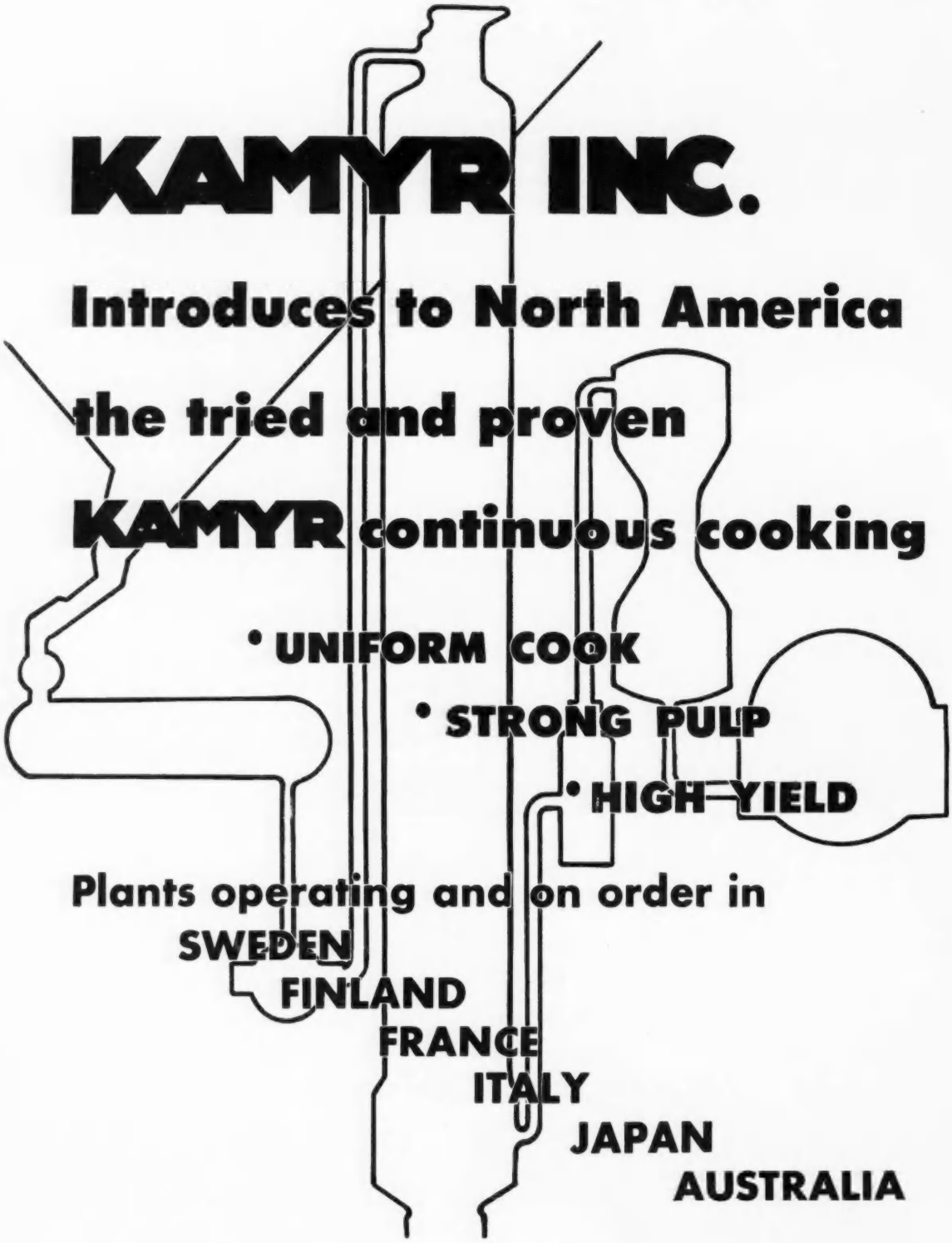

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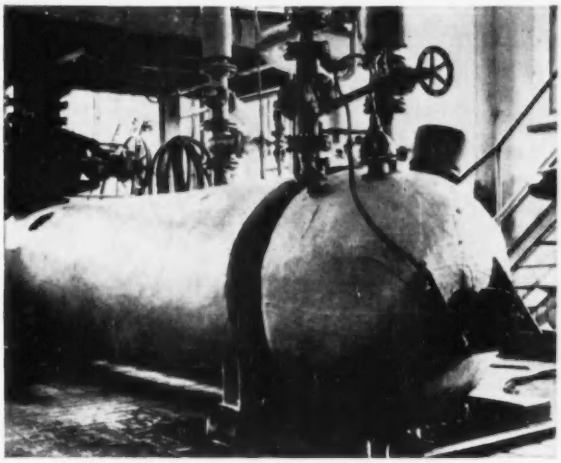
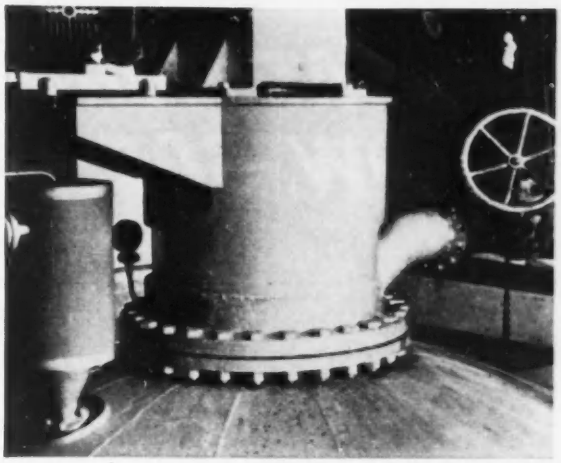
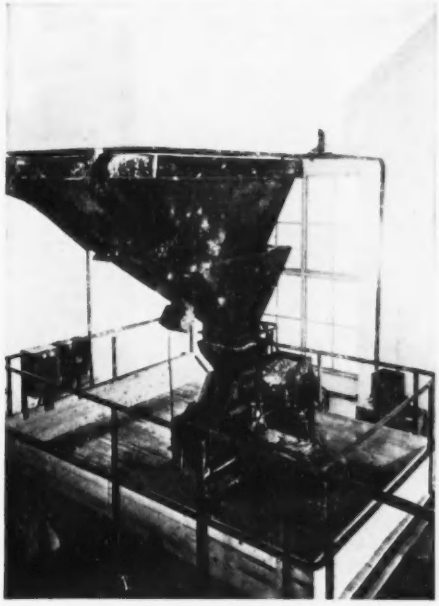


STEAMING VESSEL



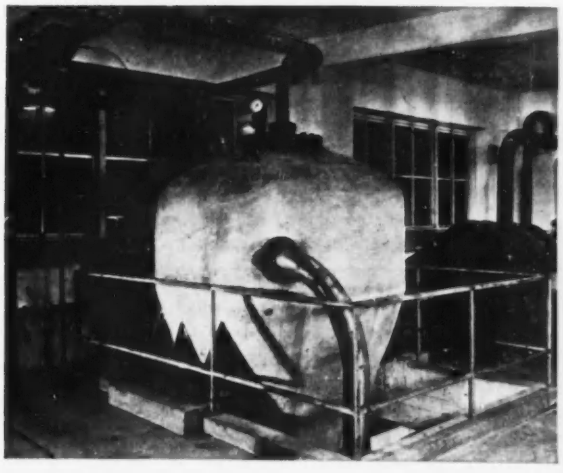
TOP OF DIGESTER

KAMYR CONTINUOUS COOKING OPERATING VIEWS

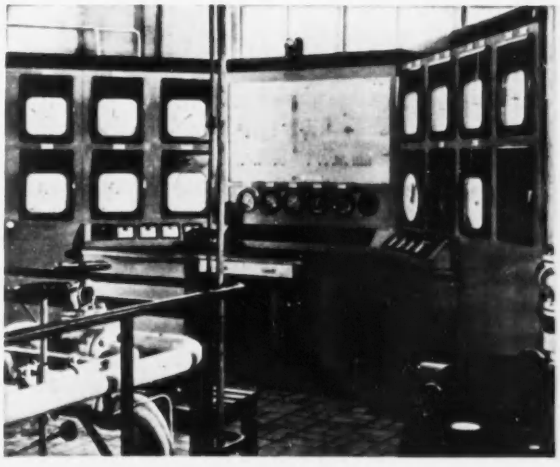


CHIP FEED

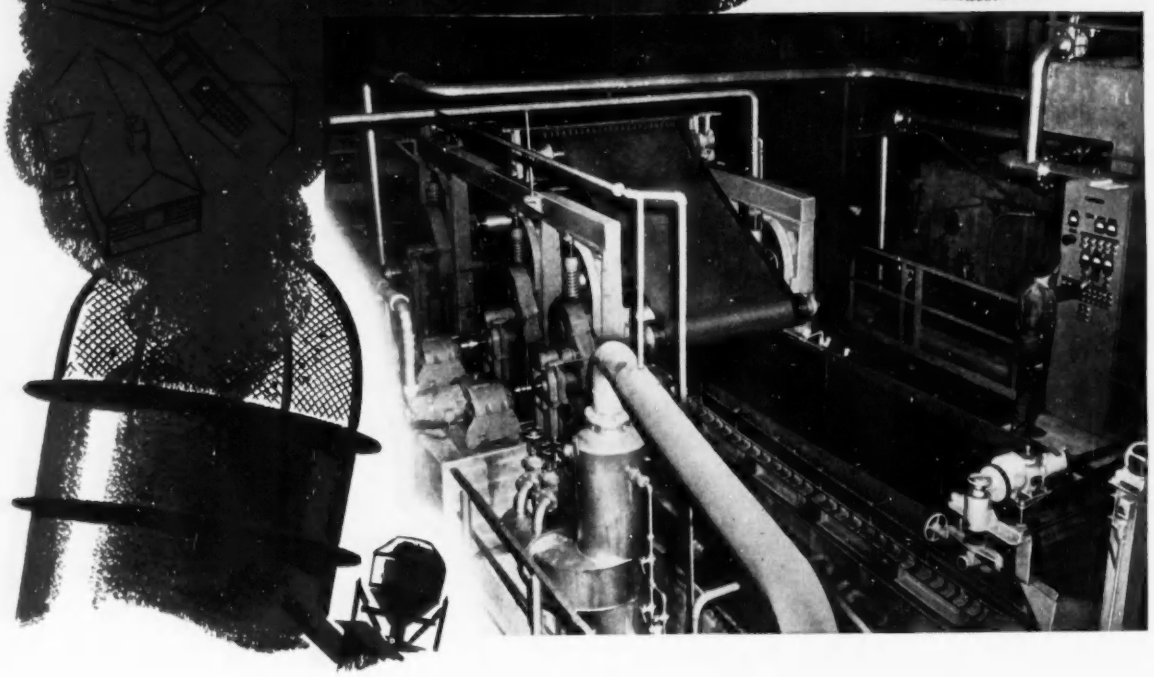
TOP OF BLOW TANK



INSTRUMENT PANEL



WHAT WENT UP IN SMOKE NOW GOES UP IN HOMES



DOWNINGTOWN HARDBOARD MACHINES HELP CONVERT LUMBER BY-PRODUCTS INTO PROFITABLE BUILDING MATERIAL

Downingtown Fourdrinier-Type Hardboard Forming Machines and Press Sections are playing an increasingly important role in a great new industry. Bark, slabs, chips and other lumber manufacturing by-products, which were once burned, are now being successfully and economically converted into hardboard for American homes. Pulp mills also use Downingtown Hardboard Machines to manufacture hardboards from available stands of hardwood, undesirable for pulp.

Downingtown Hardboard Machines are now operating in several important lumber producing areas and quickly repaying their costs in the profitable utilization of what was once "waste" material. Similar Downingtown machines are built to produce insulation and wallboards of all types.

A Downingtown Sales Engineer will be glad to discuss any of these machines with you. Or write for Bulletin 549.

DOWNINGTOWN MANUFACTURING CO. DOWNINGTOWN, PA.

West Coast Representative: John V. Roslund, Pacific Building, Portland 1, Oregon

DOWNINGTOWN

DESIGNERS AND BUILDERS OF PAPER BOARD AND FELT MACHINES SINCE 1880

MODERNIZATION IS PROFITABLE

TRENDS

PAPER TRADE JOURNAL

Paper Stock Men Examine Their Industry Outlook

The short- and long-term outlook for paper stock, bagging and other salvage materials was a serious subject for the 41st annual convention of the National Association of Waste Material Dealers held at the Waldorf-Astoria, New York, a week ago.

The industry's depressed record for 1953 — at a time that consuming mills were achieving an all-time high in production — also was a high point of discussion.

Planning Is Hazardous, Lipkowitz Tells Annual Meeting

In a forthright speech that won hearers to his optimism, to his faith in their industry and in America, retiring-President Henry Lipkowitz, Atlas Metal Co., Cleveland, Ohio, told the annual meeting that planning for the future in a time like this is not only difficult but hazardous; it may even appear impossible.

"No one can be sure of too many things these days," Mr. Lipkowitz said. "We have had as many experts telling us about the future of the national economy as there are newspapers. I am not sure if we are going up, down, or just sideways. One thing I do know; we are going somewhere. A friend of mine gave a fairly good picture of what has been happening. He said that we have been running along at such high speed that our economic temperature has gone up to about 105. Now we are back somewhere near normal and everybody feels sick.

"It will take us a little while to get used to this new condition; we may not like it. Call it anything you like; it hurts. Nevertheless, I am basically a long-run optimist. . . . In a word, I don't think the country is going to the dogs. . . . We have learned to live with crises of all kinds. . . . We have adapted ourselves to changes with remarkable flexibility. . . . We shall go on planning for the days ahead as foresighted people always plan. . . . When we realize our part in the big picture of a tremendous nation where 60 million people are hard at work day in and day out, we can take pride in our share of this achievement."

Waste Materials Weakness Forecast for 1954 by Dr. Roos

A luncheon address to the opening session by Dr. C. F. Roos, president, The Econometric Institute, New York, presented some economic facts of life which set the sober tone of the convention.

With his usual thoroughness, Dr. Roos told the dealers he believes the "demand for waste paper will probably decline moderately during 1954.

A further and more detailed study of the paper stock outlook made to the Waste Paper Institute by Dr. Jacob Baker, vice-president of Econometric Institute, is featured on page 32 of this issue.

J. S. Miller Bats For Board and Carton Co.'s

The exacting requirements of today's competitive market for a quality board that will carry as well as sell merchandise; and the absolute need for uniform paper stock that will be free of foreign stuffs was pointed up by Joseph S. Miller, general manager of New Haven Board & Carton Co. and president of Bartgis Bros. Co.

Mr. Baker explained how at the insistence of their customers that they conquer the problems of defective board and cartons, his company had installed Quality Control Departments to guarantee quality and uniformity of output. Though a comparatively small company, sizable amounts are spent annually for equipment that will eliminate foreign material received in waste paper, he said.

Policy of ECC. Mr. Baker also is chairman of the Eastern Conservation Committee of Wastepaper Consuming Industries. His remarks therefore carried particular drive despite his quiet delivery.

"Most of the waste paper dealers have been in business for a great many years and have steady customers who would like to get material that will not cause any shutdown in their plants or cause rejection of board due to poor quality," he said. "Frankly, in our own plants we are far from being able to attain this objective at the present time; and one of our major considerations is to run all of our equipment without downtime."

As to the future, Mr. Baker told the Waste Paper Institute he believes board and box plants and paper stock dealers have the same opportunity to grow: by improving production techniques to make available a quality product for a wider degree of usage.

The policy of ECC, Mr. Baker stated, is directed towards building up demand for waste paper; and it is definitely the consensus "that furnishing uniformly high quality material free of foreign material—and especially material that does not disintegrate and beat up properly—will assist most in making us competitive, and enable us to use maximum amounts of waste paper."

How Get Quality Stock? Refuse Anything Else, Dealers Say

The mill spokesman thus dropped a white-hot coal into the assembly. Last year was a poor year for their industry, though a banner record for paper and board. And it's getting so it hurts!

Dealer friends tell us that as high as 70 percent of high grade New York packings are being rejected by the mills at a time when handling and trucking costs are at an all-time high and mills diverting to wood pulp.

"What can we do with members of our own association who are responsible for the bad packs? Can we black-ball them? Many of us would surely like to see the NAWMD take such decisive and immediate action," representative dealers say.

Major producers believe the mischief can't be remedied that way. Tell the mills it's up to them to reject the bad stock; refuse it definitely; don't dicker for a bargain. And make that a rule from which no price haggling can seduce them. Adamancy in mill purchasing departments will get quality stock, officers of the W.P.I. believe; and the moment for action was never more right than just now.

Roofing Rags Lose Market. Because of dirt, synthetics and other undesirables in No. 2 roofing rags, defibrated wood pulp and *mixed* paper are now the preferred furnish of roofing mills. Dealers last week were told that bad packing of roofing rags had killed their market.

The lesson is not lost on waste paper packers.

Wood Pulp Prices To Hold At Current Levels

Most major producers, domestic and Scandinavian, have announced wood pulp prices for the second quarter at unchanged levels. Uncertain factors in the United States economy serve as a deterrent to the wanted increases. Supplies are expected to be adequate on a firm market.

—E.P.N.

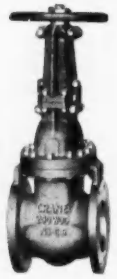
Paperboard Production (Tons)*

	Mar. 13 1954	Mar. 6 1954	Mar. 14 1953
Production	243,388	223,579	242,903
New Orders	253,105	304,917	226,218
Unfilled Orders	410,258	401,043	517,597
% of Activity	91	88	94

* Source: National Paperboard Assn.

seating surfaces stay

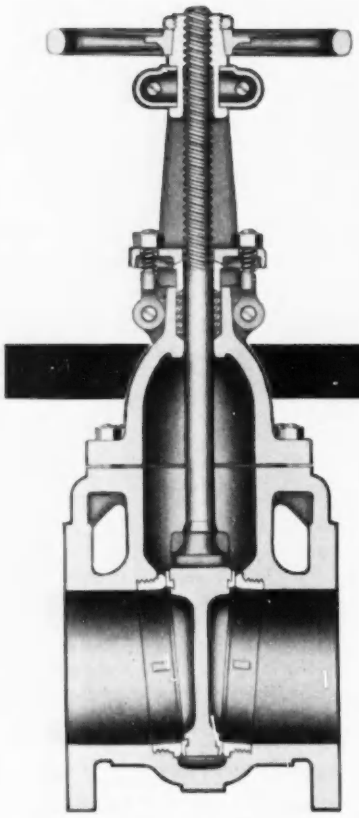
Slick as a Whistle



...in CRANE 18-8 Mo ALLOY TRIMMED ALLOY CAST IRON GATE VALVES

This is the valve that cancels out seating surface corrosion economically in many piping processes. Its seats, disc, and stem are Crane 18-8 Mo alloy steel—an exceptionally high-grade stainless steel, highly resistant to most corrosive fluids.

NOW IN SIZES UP TO 18 INCHES



Cross-Section No. 14477
Crane Alloy Cast Iron Wedge Gate
18-8 Mo Alloy Trimmed
Flanged Ends
WORKING PRESSURES: 200 pounds cold water, oil, or gas, non-shock.
Sizes: 2, 2½, 3, 4, 6, 8, 10, 12, 14, 16 and 18 in.

You'll recognize this valve pattern. It's the same as the famous Crane all-iron wedge gate, with the same liberal metal sections for maximum strength, and with tie-ribs on bonnet and end flanges for extra resistance to line strains. The big difference in these No. 14477 valves is: the body and bonnet are nickel low alloy cast iron, having much better physical properties and corrosion resistance than ordinary cast iron.

TYPICAL APPLICATIONS

In the *Petroleum* industry, these valves are giving outstanding service on oils with traces of mineral acids . . . in *Wood Treating*, on creosote vapors and oils . . . in *Pulp and Paper* processing, on alkaline liquors of various kinds. In fact, No. 14477 valves are ideal for mildly corrosive services where all-iron valves are inadequate but where it is uneconomical to use all-stainless steel valves.

A new circular on No. 14477 gives complete specifications and lists new sizes available. Write direct, or ask your Crane Representative for a copy.

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QUESTIONS and ANSWERS on the startling effects of SILENE® in PAPER!

WHAT IS SILENE?	Silene is a precipitated, calcium silicate of extremely fine particle size. It is a white amorphous powder as supplied to the paper trade.
WHEN WAS IT DEVELOPED?	Silene, an exclusive Columbia-Southern product, is a relatively new product to the paper trade although it has been in commercial production for fifteen years. Up to this time, its principal use has been in the manufacture of rubber where carloads are used daily as a reinforcing agent.
WHAT IS THE NATURE OF SILENE?	Silene in paper furnishes differs from that of conventional pigments in several important ways. First: Silene is alkaline in nature and will react with acids in a paper system. Second: Reaction with acids usually found in a paper system forms insoluble products which act as pigments and increase the ash of the paper. Third: The tiny particles appear to have an unusual affinity for cellulose fibers which represents a unique type of pigmentation.
WHAT ADVANTAGES CAN BE EXPECTED THROUGH THE USE OF SILENE?	Silene offers the opportunity of lowering costs and improving quality in many kinds of paper. Specific examples are: Bleach-lined boxboard, Board specialties, Writings, Offsets, News, Book (coated and uncoated).
ARE THESE RESULTS BASED ON ACTUAL TESTS?	Yes, while the whole effort has been backed by extensive laboratory work, the information presented is based on actual paper machine runs and established operations.
WHAT ARE THE SPECIFIC EFFECTS OF SILENE IN PAPER?	Silene increases opacity, improves brightness, formation, smoothness and printability. Compared with other loading agents, Silene gives higher tear and bursting strength values.
WHY SHOULD I BE CONCERNED?	Because of Silene's advantages, you should confirm, *as others have confirmed*, the savings and improved paper quality that are available today to your company.
WHERE CAN I GET FURTHER DATA AND INFORMTAION?	It may be obtained for the asking, along with experimental working samples if you wish. Just write the address below.

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WEEK OF PAPER TRADE JOURNAL MARCH 26, 1954

Pacific Mills Ltd. to Change Name

Crown Zellerbach Canada Ltd. is to be the new corporate name of Pacific Mills Ltd., effective April 16.

The change in name will involve no change in company officers, says Paul E. Cooper, president of Pacific Mills.

Frank N. Youngman was recently elected a director and chairman of the board of Pacific Mills, following his resignation as a director of the parent company, Crown Zellerbach Corp., and as director and president of St. Helens Pulp & Paper Co. Mr. Youngman joined Pacific Mills Ltd. as vice-president and director in 1927.

Virginia Area Appraised As Site for Pulp Mill

According to the *Roanoke Times*, the Chamber of Commerce of Pulaski, in southwestern Virginia, is investigating the economic feasibility of establishing a pulp mill on nearby New River. Forestry officials have informed the group that the area offers ample water and wood to support a mill.

A special committee composed of federal and state foresters, railroad officials, and a power company representative is now seeking information on markets, supply, and allied items for future presentation to interested parties.

Recent Improvements Boost Production of Gardiner Paper Mills

Robert E. Kinsey, general manager of Gardiner Paper Mills, Gardiner, Me., has revealed that the company's average production rose 25 percent last year as a result of production improvements and other factors. He expects that improvements scheduled for this year will boost production another 25 percent.

During 1953, the mill accomplished the installation of a quality control lab, the laying of 2,000 square feet of concrete flooring, the installation of new ventilating equipment and automatic controls in the boiler room.

This year, plans are ready for the installation of a completely new press section on the cylinder board machine, and a duplex cutter and guillotine cutter.

Condemns Destruction of Canadian Pulp Timber

Premier Joseph Smallwood has angrily ordered a stop to the "damnable" destruction of valuable pulpwood timber on a Dominion Government construction job at Gander airport.

About 3,000 cords of pulpwood were knocked down by bulldozers working on the Transport Department project.

State Secretary John Pickersgill, Newfoundland representative in the Cabinet, said in Ottawa a probe had been ordered and that Transport Department officials were on their way to Gander to confer with the North Shore Construction Co., which is doing the job.

"This wanton destruction of our province's natural wealth is a damnable thing and I hereby order you to stop from this moment," Premier Smallwood said in a wire to the construction firm.

"I expect you to take this matter up with the Government before any further destruction of timber under any circumstances is permitted under any conditions," the wire said.

Salvage value of remaining trees is estimated at $500,000. The pulpwood would be sold to paper companies. A 207-acre was levelled.

Construction company officials said they were carrying out a Government contract and refused to comment on the matter.

In Ottawa, Department of Transport officials said March 12, that it is up to the construction company how the pulpwood is to be disposed of. Information in the capital is that the company could not get a bid for the pulpwood that would cover the cost of salvaging it. So, following the usual Newfoundland practice, which hitherto has not met objection, decided to use the pulpwood as fuel to burn stumps and roots.

Pulp Firm Eyes Missoula

The Missoula, Mont., Chamber of Commerce announced March 7 that an unidentified firm has written concerning an interest in establishing a paper and pulp mill in that city.

The chamber said it could not release the name of the firm but could say that complete information on the city had been sent in reply.

Hudson Expansion Continues at Augusta

In a continuing program of expanding the production facilities of its Kennebec Division at Augusta, Maine, the Hudson Pulp & Paper Corp. has recently broken ground for the construction of a new large warehouse.

Last year, Hudson completed an $800,000 project of rebuilding this mill's No. 2 paper machine. The paper output of the machine increased accordingly 40 percent, and it is expected that the objective of a 50 percent increase will be reached this year.

Ecusta Again Gets Top Award in Safety Group A

The Paper Division of Ecusta Paper Corp., Pisgah Forest, N. C., has received for the second time the first place award in the safety contest in the Group A Section of the Pulp and Paper Division of the National Safety Council for 1953. The Ecusta Division won the award for the first time in 1952.

Competing with 52 mills in the United States and Canada, the Ecustans had an accident frequency rate of .43 as compared with a 5.94 average for all mills in the group. Group A includes mills which have an average of more than 170,000 man hours per month, indicating that each mill has more than 1,000 employees.

H. E. Newbury, safety director, expressed his sincere appreciation to every individual in the paper division of the Pisgah Forest plant for the wonderful attitude and cooperation in the overall program for the prevention of personal injuries.

Bird Opens Connecticut Branch

Bird & Son, Inc., East Walpole, Mass., plans to operate a Fibre Box Division branch plant at New Britain, Conn. Equipment for manufacture of cleated fiber boxes will be set up in an existing building. In the same location will also be installed a new sheet plant for manufacture of corrugated boxes. Board for this plant will be supplied by Bird's East Walpole operations. Chester Porter will be transferred from the company's Industrial Engineering Division and will be placed in charge of the new plant.

Natal to Get Rayon Pulp Plant

Progress in construction of a rayon pulp plant at Umkomaass in Natal, Union of South Africa, has been reported by the Industrial Development Corporation (IDC), a Government agency. The project, estimated to cost £6 million, is financed jointly by the corporation, Snia Viscosa of Milan, Italy, and Courtaulds of England.

A company registered under the name South African Industrial Cellulose Corporation (SAICCOR) will operate the plant, whose entire initial output will go to Snia Viscosa and Courtaulds.

Improved Waste Control Reported in Wisconsin

Continued improvement by the Wisconsin paper and pulp industry in reducing water pollution was reported at Milwaukee, March 17, by Harold N. Kingsbury, associate public health engineer for the state.

In a report to a meeting of the advisory committee of the State Committee on Water Pollution, Mr. Kingsbury said the amount of wood fiber discharged into streams has been reduced by the wrapping paper, black wadding, rag and deinked pulp, kraft pulp, groundwood and semichemical pulp mills. It increased, however, from book paper, tissue, bond, glassine, board and sulphite pulp mills.

Also noted were greater efforts by mills to prevent discharge of sulphite waste liquor into streams. Fewer critical oxygen conditions were found in state waters last year than had previously been caused by mill pollution.

H. A. Rothschild, of the Kimberly-Clark Corp., Neenah, advisory committee chairman, reported that after spending large sums for various devices, his firm had found cheap screens with small holes the most effective way to control paper mill woodroom waste.

Gradner H. Chidester, of the U. S. Forest Products Laboratory, Madison, said the laboratory had started new experiments to determine the constituents of sulphite liquor, what they are good for, and how they can be used to make useful by-products.

Dr. Willis Van Horn, of the Institute of Paper Chemistry, Appleton, told the committee that experiments had shown that the warmer streams became the more oxygen was needed by the fish.

Groff Collett, of the Sulphite Pulp Manufacturers' Research League, Appleton, and J. M. Holderby, of the Rhinelander Paper Co., Rhinelander, reported that 60 million gallons of sulphite liquor will be used this year on about 4,000 miles of Wisconsin roads. This will be 13 million gallons more than was used last year, and 1,000 more miles of roads than a year ago.

New experiments will be conducted in southern Wisconsin counties this summer with concentrated sulphite liquor, shipped after evaporation to eliminate payment of freight on the water, which is restored before the sulphite is used.

Holderby said new research into wood sugars and yeast fermentation was resulting in less solid matter in discharges from mills, and that further research was under way to learn whether these solids might be utilized as food.

N. L. Malcove, Green Bay, waste disposal expert for the Marathon Corp., told the committee that the Brown County Highway Commission has such faith in sulphite liquor that it will not put a blacktop surface on any road until the road has first been treated with the sulphite.

Carolina Champion Plans Open House

The Carolina Division of The Champion Paper and Fibre Co., Canton, N. C., plans an Open House on May 4-5-6-7.

Tours of their plant will be conducted each morning and afternoon during the four days. The tours will end at the company's cafeteria where visitors will be served refreshments and will have the opportunity to inspect an attractive 130 ft. display of exhibits of all phases of the company's activities.

Throughout the Open House there will be continuous showings of Champion's three new all-color movies — "Deep Roots," "Paper Work," and "Good Business." The latter film has recently been honored by a special award from the Freedom Foundation.

An open invitation is being extended for this event, and Carolina Champion will be very happy to receive members of the pulp and paper industry. Preparations are being made to entertain 12,000-15,000 persons during the four days.

Paper and Board Production

According to the American Paper and Pulp Association, the ratio of United States paper production to mill capacity for the week ending March 13, 1954, was 94.2 percent, compared with 94.0 percent revised, for the preceding week. The ratio was 95.1 percent for the corresponding week a year ago. Mills producing newsprint exclusively are not included.

The paperboard production ratio for the week ending March 13, 1954, was 91 percent, compared with 88 percent for the preceding week, and 94 for the corresponding week last year.

(Detailed statistics on page 49.)

1953 Forest Tree Planting Sets Record

Forest tree planting last year was a record 715,548 acres, the U. S. Department of Agriculture reported early in March. Forest and shelterbelt planting by public agencies, forest industries and individual landowners in the year ending June 30, 1953, was 193,000 acres (37 percent) more than was planted in the year ending June 30, 1952, which was the previous record year.

Of the total acres planted 77,612 were on federally administered lands, 63,791 on lands administered by the states or other non-federal public agencies and 574,145 on privately owned lands.

Private land planting, which was 168,000 acres over that of 1952, was particularly encouraging because about 80 percent of the reforestation work to be done is on privately owned land. In 1940-41 only three states reported private land planting in excess of 15,000 acres a year, but last year (1953), 12 states reported more than that. Moreover, Louisiana, Florida, Georgia, and Mississippi each reported more than 57,000 acres planted in 1953.

Stieg Retires from Rayonier After 20 Years

After a career of exactly 20 years to the day with the Rayonier organization, Fred B. Stieg announced his retirement early this month. At a luncheon held in New York, he was presented a 20-year service pin in recognition of his service with Rayonier Incorporated.

Mr. Stieg joined the chemical cellulose producer as a nitration specialist, and was active in the development of Rayonier cellulose for nitration purposes during the 1930's. In recent years he was in the company's sales department where he concentrated on paper pulp sales.

David Luke Comments on Container Outlook

In his annual report, David L. Luke, Jr., president, West Virginia Pulp and Paper Co., had the following to say about the board and paper market.

"The decline in demand for container board results from only a moderate decline in the demand for corrugated boxes, but more importantly from inventory adjustments being worked out by box makers.

"Natural growth factors continually at work give us great confidence in the stability of the corrugated box business, as well as the future of the container board business," he said. "Fortunately, the paper business — both white and kraft paper — has stood up very well under the much-discussed economic adjustments. Demand is good and prices are firm."

Mr. Luke said he felt justified in the hope that succeeding quarters of the year will average out at a little higher level than that of the first quarter, although inventory corrections and new production may depress the operating rate in the container board field.

Gardner Celebrates Safety Record

Whistle-tooting at the Gardner Board and Carton Co.'s Middletown and Lockland plants at 3 p.m. Thursday, March 18, marked a milestone for the firm. At that instant, Gardner employes had worked a million consecutive hours without a lost-time accident.

Employes with the longest Gardner service records got the honor of pulling the cords to blow the steam whistles. At Lockland 53-year veteran Al Clegg, powerhouse superintendent, did it. John Ditmyer, Mill 1 superintendent, also a 53-year man, pulled the whistle cord at Middletown.

And at 3 p.m. each day from now on until a lost-time accident happens, the whistles will blow again, to remind employes and townsfolk another safe working day has passed.

Friday everyone at Gardner, about 2200, was treated to free ice cream and cake to help celebrate the occasion. The ice cream bricks had green safety crosses on them. The large cakes had "1,000,000 hours worked safely" in icing.

It is estimated that one man, working 40 hours a week, 50 weeks a year, would have to work safely for 500 years to reach a million hours. He'd complete the job in 2454 A.D.

Escuta Sets Safety Record

The Paper Division of Ecusta Paper Corp., a subsidiary of Olin Industries, Inc., March 18 at midnight, set a new world's record as the safest fine paper plant for employees anywhere, according to records of the National Safety Council.

On March 18, Olin's paper plant, located at Pisgah Forest, marked up 439 consecutive work days and 2,811,400 man-hours with no disabling accident of any kind. This surpassed the previous world's safety record for fine paper mills held by Canadian Cellucotton Products Co., Ltd., Niagara Falls, Ontario. The old record was 2,809,700 man-hours with no disabling injury.

Walter B. Stovall, Jr., senior statistician of the National Safety Council, said in announcing the new record that Olin's attainment marks the best safety record for fine paper mills since reports covering the world were started in 1923.

The record was based on the American Standards Association Code for judging injuries. The last injury at Olin's Pisgah Forest paper plant was on January 2, 1953. A special award of honor is being assigned to the plant by the National Safety Council.

Professor O'Neil Speaks at Southeastern TAPPI

TAPPI men in four Southeastern states converged on the George Washington Hotel, Jacksonville, Fla., for the March 19-20 gathering of the Southeastern Section, Technical Assn. of the Pulp and Paper Industry.

Principal speaker after the Friday night banquet session was Prof. Fred O'Neil of the College of Forestry, State University of New York, at Syracuse.

Other speakers who covered various phases of the industry were R. H. Renko of the Diamond Power Specialty Corp., Lancaster, Ohio; R. M. Taft, field manager of Factory Insurance Assn., and J. H. Mappus, Jr., West Virginia Pulp and Paper Co., Charleston, S. C.

The meeting was attended by members from Florida, Georgia, South Carolina and North Carolina. The host mill is St. Regis Paper Co., whose plant at Eastport, Fla., was toured by the TAPPI members on Saturday morning.

February Newsprint Statistics

Production and shipments of newsprint in North America during February 1954 amounted to 546,124 tons and to 523,999 tons respectively, compared with corresponding totals of 522,059 tons and 491,818 tons in February 1953, according to the Newsprint Service Bureau. Output in the United States was 88,197 tons and shipments were 86,219 tons while Canadian (including Newfoundland) production amounted to the record February high of 457,927 tons and shipments to 437,780 tons.

Through the end of February this year United States mills turned out 7,800 tons or 4.4 percent more newsprint than in the first two months of 1953 while output in Canada also was 21,271 tons or 2.3 percent greater than in the corresponding period of last year, thus the continental increase totaled 29,071 tons or 2.7 percent.

North American manufacturers' stocks on February 28, 1954, aggregated 166,228 tons compared with 144,103 tons on the last day of the preceding month and 170,373 tons at the end of February 1953. The continental total was composed of 11,156 tons and 155,072 tons held by United States and Canadian mills respectively and inventories were lower than a year ago by 135 tons in the former instance and by 4,010 tons in the latter.

Maine Paper & Water Men To Sit on Colby Panels

Two of the three panel discussions scheduled by the Institute for Maine Industry at Colby College, March 27 will develop subjects of direct interest to the state's paper companies. Maine members of the American Pulp & Paper Assn. will participate in discussions of the Taft-Hartley Act and industrial stream improvement problems.

Discussing the labor law will be Robert E. O'Connor, secretary of industrial relations committee, APPA. Edward R. Frisby, personnel director, Oxford Paper Co.; Elmo B. Stevens, assistant manager of northern mills in charge of personnel, Hollingsworth & Whitney Co.; and John Milliken, personnel director, S. D. Warren Co.

The state's water situation will be investigated by Russell I. Winget, executive secretary, National Council for Stream Improvement; Harry W. Gehm, technical adviser, National Council for Stream Improvement; Walter Lawrence, chairman of chemistry department, Bates College, and J. Elliott Hale, superintendent, Kennebec Water District.

PAPER PEOPLE

DAVID L. LUKE III, a vice-president of West Virginia Pulp and Paper Co., was elected to the company's board of directors at the annual meeting of stockholders. Mr. Luke is responsible for liaison with the company's subsidiaries, The Hinde & Dauch Paper Co. and Rigesa, S. A., in Brazil, and also coordinates research and planning and directs broad financial studies.

E. CRAWLEY WILLIAMS, JR., resident manager of the Covington, Va., plant of West Virginia Pulp and Paper Co., was elected to the company's board of directors at the annual meeting of stockholders. Mr. Williams has directed the company's operations at Covington since January 1951.

Canadian Technical Men Join Bowaters Southern

Dr. J. N. Swartz, Howard Smith Paper Mills Ltd., Cornwall, left to join the Bowater's Southern organization as technical services superintendent.

F. P. Moden left Anglo-Canadian Pulp & Paper Mills Ltd. where he had been control superintendent up to a few months ago, following which he was assigned to special duties for Bowater's Southern where it is our understanding that he will be assistant paper mill superintendent.

S. Richardson, control superintendent at The Great Lakes Paper Co. Ltd., is now assistant to J. N. Swartz at Bowater's Southern.

Two Paper Executives Named Directors of Controllers Institute

Stuart W. McLaughlin, comptroller, West Virginia Pulp & Paper Co., New York, and Nelson T. Hampson, treasurer, Lowe Paper Co., Ridgefield, N. J., have been elected directors of the Controllers Institute. Their election took place at the organization's 23rd annual meeting of the members, held in the Sheraton Park Hotel, New York City.

Mr. McLaughlin, who has been a member of the Institute since 1945, is serving his second term as assistant treasurer. Mr. Hampson is president of the New York City Control. He first joined the national controllers' group in 1943.

Established in 1931, the Institute is a non-profit organization of controllers and finance officers from all lines of business — banking, manufacturing, distribution, utilities, transportation, etc. The total membership exceeds 4,200.

Noble Placed in Charge of Triangle Container Plant

Triangle Paper and Box Co. has appointed Joseph A. Noble plant superintendent in the corrugating plant at 1501 W. 15th street, Chicago. Mr. Noble, with 25 years of experience in corrugating manufacturing operations, will have complete charge of Triangle's container plant. Mr. Noble is no newcomer to Chicago, having spent 15 years with the Stone Container Corp. in a similar capacity.

J. F. Brinkley Moves To San Francisco

James F. Brinkley has joined Everett Pulp and Paper Co.'s San Francisco office as converted products salesman in the Northern California territory. Until recently with the company's home office and mill at Everett, Wash., Mr. Brinkley serves with R. A. Gates, district sales manager.

Honor Bill Crute of Champion

W. R. Crute, Champion Paper and Fibre Co., vice-president, was paid a special tribute early in March, when more than two hundred civic and business leaders in the Pasadena, Texas, area staged a "Bill Crute Day" at the city's Rotary Club meeting.

The occasion marked only the second of its kind in which such an honor has been extended in the highly industrialized Houston Ship Channel sector, where Champion Paper's Texas Division mill is located. It came only a few days before Mr. and Mrs. Crute departed for a combined business and pleasure trip in touring Sweden, accompanied by John Parrott, assistant pulp mill superintendent.

Among old friends and co-workers with whom Mr. Crute has helped build an industry and community, Champion Paper's Board Chairman, Reuben B. Robertson, and President Reuben B. Robertson, Jr., made a special air trip from the firm's general office at Hamilton, Ohio, to be present in acclaiming the honoree who became associated with the company in 1917.

Mr. Crute designed and directed construction of Champion Paper's Texas Division mill 18 years ago. Meanwhile, he has managed its growth from a pulp mill employing 350 persons to its present status as a ranking pulp-paper producer with 1750 employees.

Champion Promotes Bendetsen

Karl R. Bendetsen, who has been doing the job of Texas division manager of Champion Paper and Fibre Co. for several months, was appointed to that position on March 8, after Mr. and Mrs. Crute left for an extended trip to Sweden. W. R. Crute, vice-president and former manager of the division, has been releasing more and more plant operation responsibilities to him, since he came with Champion in November 1952.

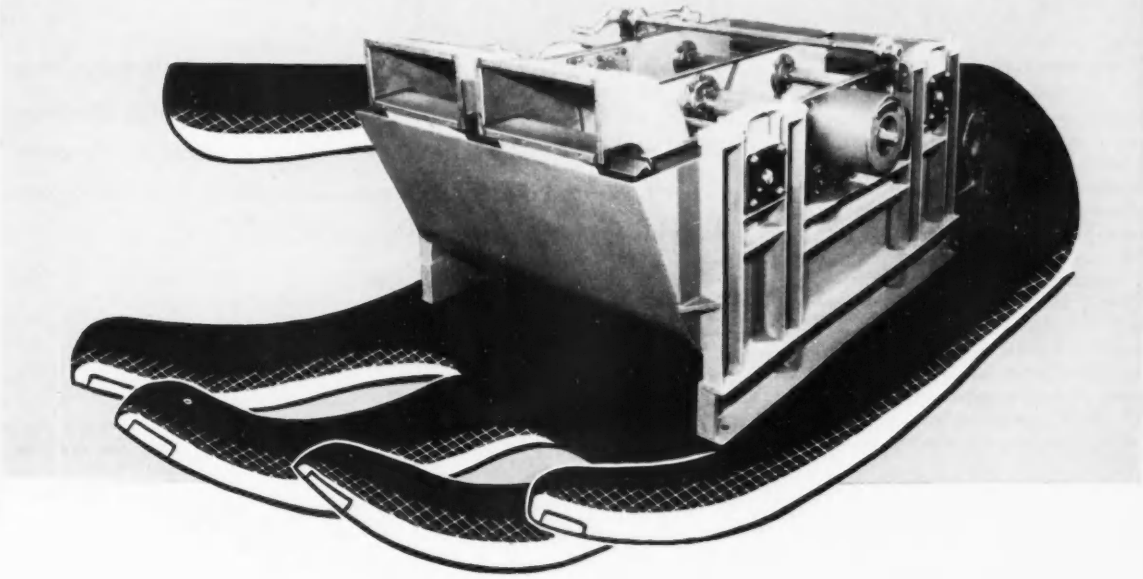
Mr. Crute will continue to be the titular head man in the Texas division, but from now on he will have none of the responsibilities of plant operation.

Mr. Bendetsen had a distinguished career as attorney and in special and difficult government jobs before joining Champion.

A graduate of Stanford University, he practiced law in Washington, Oregon and California. His legal work was mainly concerned with the logging, saw milling, pulp, paper and shipping industries.

(More People on page 23)

WHAT *You* WANT IN A PERFORATE PLATE SCREEN



CAPACITY: The Bird Jonsson Screen handles up to 200 tons of groundwood or kraft per day; 80 to 100 tons of sulphite; 40 to 50 tons of high consistency waste paper stock.

HIGH CONSISTENCY SCREENING: The Jonsson Screen works like a charm on 2½% groundwood or kraft — 1½% sulphite — 4% waste paper stocks.

LOW OPERATING COST: The Jonsson Screen employs high frequency, circular vibration to effect its extraordinary combination of screening efficiency and capacity with only 3 HP. Even on waste paper stock, power figures something like six-hundredths of a horsepower per ton.

These performance advantages make the Jonsson Screen the logical choice,

- as a knotter or bull screen on groundwood
- as a knotter on sulphite, soda and sulphate pulps
- as a knotter and chip and shive remover on brown stock ahead of the washers
- as a knotter and screen on building board, filler and strawboard stocks
- as the screen for waste paper and deinked stocks

For recommendations, layouts and estimates get in touch with BIRD MACHINE COMPANY, South Walpole, Massachusetts

The BIRD JONSSON SCREEN

Progress in Kamyr's Continuous Cooking

L. A. Lundberg

A. H. Lundberg, Seattle, Wash

Continuous cooking—a subject of great interest during the past 20 years—has, with the development of the Kamyr process, matured to the point where every manufacturer and potential manufacturer of kraft and semichemical pulp must consider the economic advisability of replacing existing equipment or installing new equipment of this type. The alternative, the author says, is to be left behind when profits fall.

Introduction

After 15 years of research and development work, Kamyr has produced a continuous cooking process capable of yielding high quality kraft and semichemical pulps of any known commercial grade. An indication of the excellence of the product is shown by the interest of the Scandinavian pulp manufacturers in the development of the process, and their subsequent orders for equipment. Many mills have further shown their faith in the process by making plans to install continuous cooking when present equipment is worn out.

In brief, the chips are passed first to a small low pressure horizontal steaming vessel where they are moved along by a screw conveyor. They are discharged through a special rotary valve and pass to the top of a long vertical digester. The chips are cooked as they pass down through the digester. Cooking is aided by the hydrostatic (pressure) head as they pass down. Of particular interest is the "hour-glass" blow tank which is described in detail later.

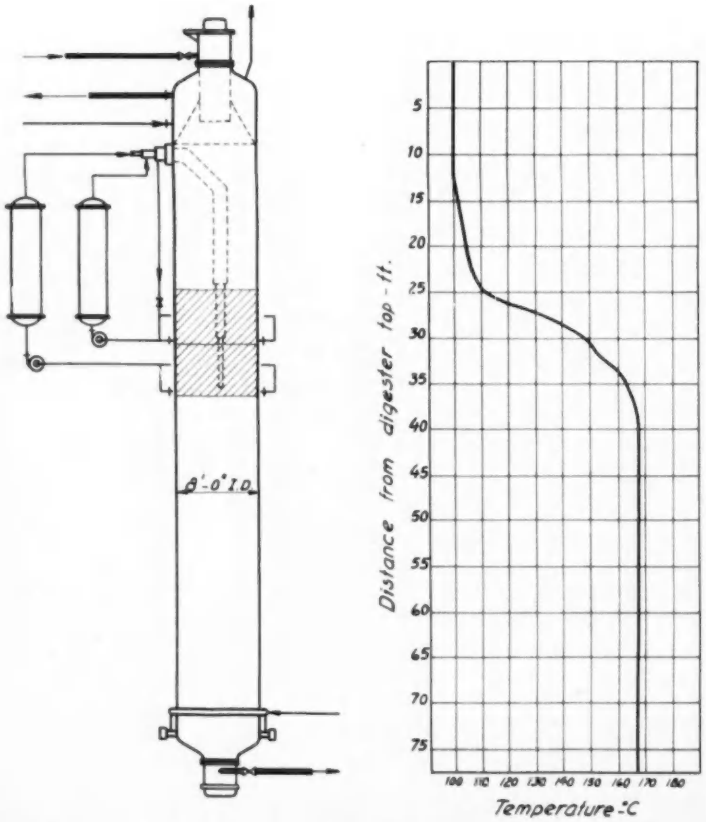


Figure 1—THE CONTINUOUS DIGESTER with a typical cooking curve for a 100 tons per day kraft mill (time at max. temp. 1 hr. 30 min.).

Mechanical and Operational Characteristics

In actual practice the equipment operates very smoothly from the chip bin to the washed stock chest, the entire operation being almost completely automatic. Since instrument controls have not been developed to the extent that allowances can be made for varying wood species and chip density, reliance must be placed on the operator to compensate for these fluctuations. Accurate control or blending of the chip feed, as is practiced in most batch plants today, will minimize the magnitude and frequency of these adjustments.

The chips are metered in to a low pressure steaming vessel where much air and turpentine are driven off. The use of flash steam from the blowtank and digester top relief for this heating also serves to concentrate most of the objectionable kraft mill odors in a single line—a major step toward air pollution control. The heated chips are then introduced directly into the digester with fresh cooking liquor at a pressure of 140 to 150 p.s.i. The temperature is in the neighborhood of 100°C. and, under these conditions, penetration is completed rather rapidly. The chips move downward by gravity through the heat-

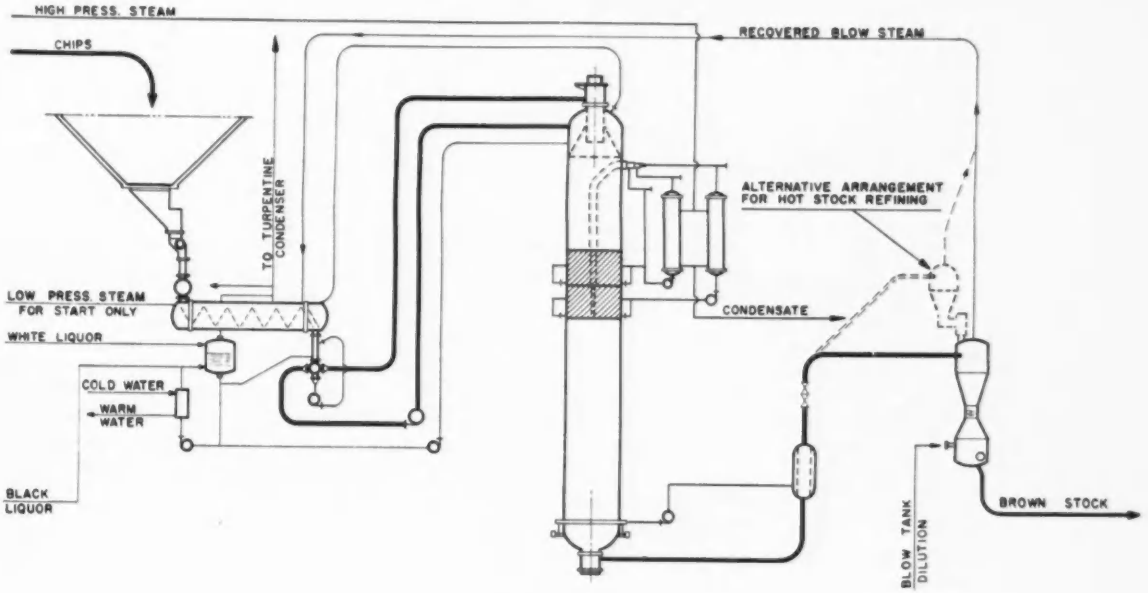


FIG. 2 CONTINUOUS COOKING FLOW SHEET

ing zone and cooking zone to the bottom cone, where a scraper dilution system ensures uniform feed to the continuous blow valve. A typical cooking curve for a 100 ton digester is shown on Fig. 1. Changes in the various zones are easily obtained when the cooking characteristics of a particular wood material are determined. The cooked stock is blown into an hour glass shaped blow-tank, the neck of which effectively isolates the two sections and allows different temperature conditions to exist. It is, therefore, a simple matter to maintain 5-7 p.s.i. steam pressure and corresponding temperature in the upper section for maximum heat recovery while diluting and cooling the stock for washing in the lower. At this point, the stock can go directly to the washer vat or, depending upon the type of pulp being produced, to the preliminary refining department.

Along with relieving the operators of their routine duties of filling and cleaning up around the digesters, there is also the possibility of centralizing controls in a more convenient location. The standard operating floor in a batch plant is traditionally on the upper floor at the digester covers, a hot and uncomfortable place at its best—hard on workers and delicate instruments alike. Controls are far from the machinery operated, and since the cook is usually busy with a balky digester or some other problem characteristics of batch operation, inspection trips are often hurried and made by an inexperienced helper. With centralized control on one of the lower floors, the operator is close to his equipment and away from the heat and fumes which tend to rise. The place may be kept clean easily, a factor in employee morale, and with instruments shouldering the burden of the work, time is available for inspection of equipment and quality control.

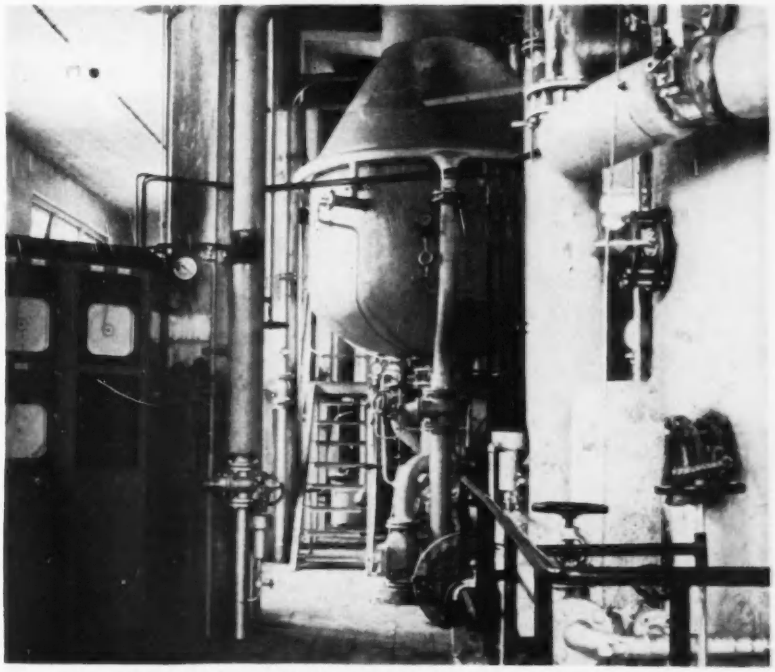


Figure 3—COMPACT CONTINUOUS COOKING OPERATING FLOOR—(From left to right—cooking and washing control panel, blow tank; washer—behind blow tank, only steps and vat show, continuous digester.)

Corrosion

Corrosion, the bug-a-boo of present day high sulphidity kraft liquors and quick cooking, has been virtually eliminated. This is attributed to the absence of thermal shock, air, and boiling within the digester. In the early continuous digesters, stainless steel was not used, but the life of those parts experiencing corrosion was considered good when compared with the life of similar parts in batch systems. The substitution of stainless steel for mild steel, at the few points of corrosive attack, has proved valuable in subsequent installations. It can be said that corrosion is not a major maintenance problem.

Scale formation in indirect heaters and strainer plates has also been minimal. At one mill the heaters are cleaned annually, and the original strainers show no change in perforation size after three years.

These factors contribute to the low overall operating and maintenance costs to be experienced with continuous cooking.

Chemical and Power Consumption

Perhaps the greatest single item responsible for the power and chemical savings realized by continuous cooking is the reduced liquor to wood ratio, 2.5:1 compared with 4:1 in most batch operations.

Power consumption for the cooking operations, including chip meter and blow tank is 2000-2400 lbs. of steam, depending upon chip moisture, and 40 k.w.h. of electricity per ton of pulp produced. Further, the demand is uniform, allowing maximum economy in power plant design and or lower rates if outside power must be purchased.

With regard to chemical consumption, the savings depend upon the effectiveness of the recovery equipment. The uniformity of the product allows higher yields for a given alkali charge. Less black liquor dilution is used, reducing the quantity to be recycled through the washers, minimizing the possibility of loss at this point, and, at the same time, yielding a black liquor of higher chemical concentration to the evaporators—thus effecting a further heat saving for the enttire mill.

Pulp Characteristics

The operational advantages of continuous cooking would be valueless if, at the same time, pulp of equal or higher quality than that now manufactured by existing methods, were not also produced. The results thus far indicate that continuous cooking yields superior pulps in all grades tested when compared with batch operations. The

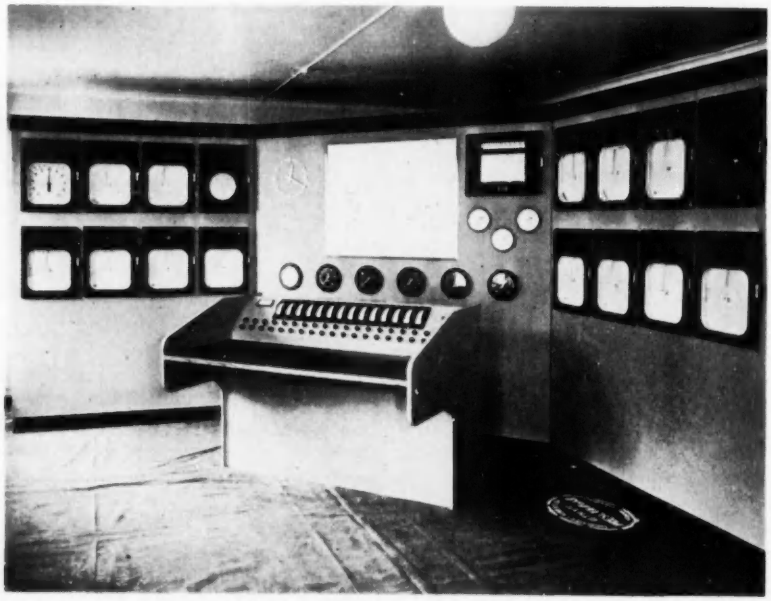


Figure 5 — GRAPHIC CONTROL PANEL — For two-stage cooking of Eucalyptus.

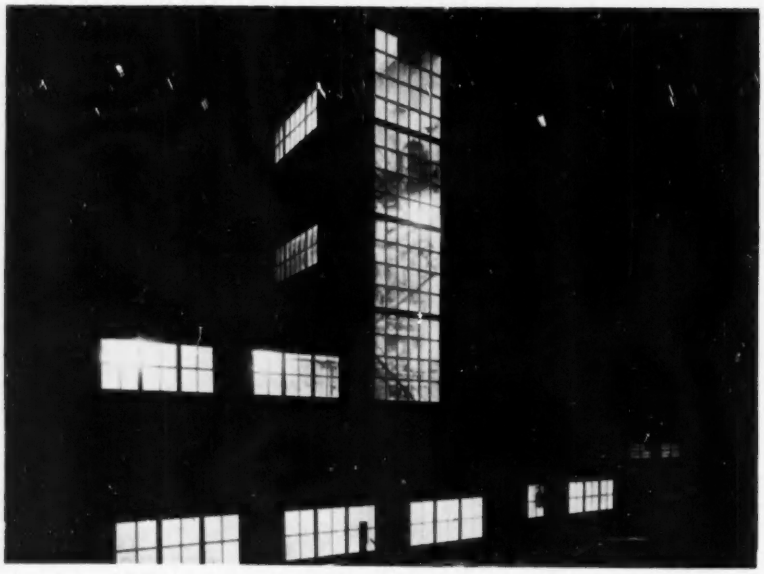


Figure 4 — CONTINUOUS COOKING BUILDING AT NIGHT — (From right to left — chip steaming, cooking, washing.)

reasons for this success are not hard to find:

- Improved penetration due to preheating and degassing
- Low temperature gradients through the mass
- Short circulatian routes minimize the possibility of channeling
- Absolute control of cooking temperature and cooking time

One mill has already increased yields by 1.5 per cent, while maintaining their quality standards on high grade kraft, due to a 50 per cent reduction in screen rejects. This fact alone is proof of product uniformity from the continuous digester.

Future Plans

With the advent of high-yield cooking, the possibilities offered by the Kamyr digester are of even more importance.

Semi-cooking involves operating during a period of high reactivity of the wood complex. Non-uniform heating or liquor distribution affects the penetration and results in non-uniform cooking, reduced yields, and higher refining costs. The flow sheet Fig. 2 shows the standard kraft cooking process—modified with a blow cyclone and preliminary refining equipment which can be used with high-yield cooking.

Continuous cooking is also expected to have a major impact on the present concept of pulp mill economics. During the past decades, pulp and paper mills have tended to become increasingly larger in size, due mainly to their attempts to approximate continuous operation with batch equipment. The tremendous production of such plants requires that they serve a very large area. Very few communities today have the raw material resources (wood, water, labor and electric power) to support such huge plants, and the transportation costs of bringing such materials to the production centers, plus the distribution of the final product, often take a major portion of the savings effected by equipment concentration. With the Kamyr cooking system, continuous operation need not be approximated, manpower requirements are reduced, and it is foreseen that smaller mills located near their raw material sources and potential markets will form the industry of tomorrow.

The author is a chemical engineer (Univ. of Wash.) with experience in West Coast pulp mills. He is at present employed with the firm of pulp mill engineers, A. H. Lundberg. Because of the mounting interest in continuous cooking and conflicting reports concerning operation of the equipment, Mr. Lundberg was sent to Sweden to Study it first hand. This report is the result of a year's work in Kamyr's offices in Karlstad, Sweden and many field trips to the Kraft mill at Fengersfors and the sulphite pilot plant at the No. 8 Domsjo mill in Ornskoldvik.

MORE PAPER PEOPLE

(Continued from page 18)

Thirty-five years of service at The Gardner Board and Carton Co., Middletown, Ohio, were marked recently by Roland W. Richardson (right), sales research supervisor. He is shown receiving his service pin from Colin Gardner, executive vice-president.

Container Corp. Names Two Sr. V-P.s

Container Corp. of America has appointed Donald H. Brewer and Leo H. Schoenhofen as senior vice-presidents of the company. Mr. Brewer will be in charge of all of the company's shipping container plants and containerboard mills east of the Rockies, including those of O. B. Andrews Co., a subsidiary. In the same territorial area, Mr. Schoenhofen will be in charge of all folding carton plants and boxboard mills of the parent company and O. B. Andrews Co., in addition to the paper stock plants of another subsidiary, Pioneer Paper Stock Co.

Until this appointment, Mr. Brewer was vice-president in charge of the company's central folding carton and boxboard division with headquarters in Chicago. Mr. Schoenhofen was vice-president in charge of the Eastern folding carton and boxboard division with headquarters in Philadelphia. Both men will now be located at the company's general offices in Chicago.

P. H. Glatfelter III Elected President

The youngest president in its 90-year-old history has been elected by the board of directors of the P. H. Glatfelter Co. He is Philip H. Glatfelter III, 38, and becomes the fourth generation of the Glatfelter family to hold that office. His father, P. H. Glatfelter, whom he succeeds, will continue active in the company as chairman of the board. He had been president for 25 years.

He started work in the maintenance department of the Glatfelter company and later was assigned to the manufacturing department. Moving through the purchasing and sales departments, Mr. Glatfelter was made a director of the company in 1944 and executive vice-president in 1948. In 1952, he was elected president of The Glatfelter Pulp Wood Co., a subsidiary of the P. H. Glatfelter Co. Except for the war years, he has devoted his business life to the Glatfelter enterprises.

The elder Mr. Glatfelter succeeded his father, William L. Glatfelter, as president, and is the grandson of the founder after whom he was named. He initiated a number of policies that made the Glatfelter product well known in the eastern half of the United States. Among these was the distribution of booklets on the technical subject of paper making which have been used as supplemental classroom reading in many universities and colleges. He also has been active as an advocate of forest conservation and woodland cultivation, a policy of the Glatfelter company for many years.

Farwell Resigns from Ryegate

Thomas Farwell has resigned as general manager of the Ryegate Paper Co. He joined the company in 1926 and was appointed assistant general manager in 1928 and general manager in 1938. When all of the stock in this company was acquired by Perkins-Goodwin interests in 1946, Mr. Farwell was assigned the additional titles of president and treasurer. Fred Vogel and Max Bliss acquired ownership of the Ryegate Paper Co. in 1951 and Mr. Farwell has served them up to the present time as general manager.

Fred Vogel will now take over the duties of general manager. Mr. Farwell will be available for advice and counsel for a period during the transition. He has not announced his plans for the future.

How to Eliminate Curling in the Manufacture of Paperboard

R. L. Wilson

Laurentide Div., Consolidated Paper Corp., Grand Mere, Que.

Some practical hints on dealing with this difficult problem by a veteran of more than forty years in board production.

By far the most frequent cause of "curl" is due to the difference in the moisture content of the top and bottom liners, and the most common type of curl is the "upward curl" with the top liner on the inside parallel with the grain.

Much of this moisture variation is due to the difference in "pick-up" from the water boxes on the calenders immediately after the dryers. Like wool and cotton, wood pulp will expand when moisture is added, and shrink when dried out again. A cheap suit or shirt will shrink to less than its original size when washed or exposed to a heavy shower. To shrink an article made from vegetable fiber, it must first be dampened.

If, for instance, the top liner of a sheet of board has absorbed more moisture than the bottom at the water boxes, it will be shrunk on its way through the finishing calenders and an "upward curl" will result. It is therefore necessary, if curling is to be avoided, that we do all we can to see that the "pick-up" at the water boxes is the same by both liners.

A machine making "screening board" which is usually made with the same stock on both liners should be checked for liner thickness. Board liner stock is usually fairly well sized, and a heavy liner will not "pick-up" quite so much moisture as a light one.

Water box temperature should be the same on both liners. Hot water or starch on the top liner will, for instance, penetrate more into the sheet than cold water on the bottom.

Liner freeness should be the same for both liners. Slow stock will shrink more in drying than free stock; thus if the top liner is slow and the bottom is free, an upward curl will result.

A sheet made with both liners of the same stock, freeness, water box temperature, thickness of liners and the same number of water boxes on each liner is not likely to curl. If such a sheet does curl, the drying efficiency and ventilation should be checked, but trouble from this source is unlikely if only occasional curling occurs.

Furnish

It is not always possible, however, to use the same grade of stock in each liner furnish. Board made with a heavy furnish of sulphite in the top liner and a low sulphite furnish in the bottom, with the balance groundwood, is very susceptible to curl if an additional precaution is not taken. Sulphite will absorb more moisture than groundwood at the water boxes. It is therefore necessary to counteract this tendency by using additional size in the top furnish and reducing the sizing in the bottom, so that the "pick-up" is the same for both liners.

A curl can frequently be stopped by simply adding or reducing the number of water boxes being used. This is not always advisable, however, as the finish and folding qualities of the board are affected.

Our object should be to balance the drying and moisture "pick-up" qualities of the board and if we do so, little trouble will result from curling.

Warping

Up to now, we have been concerned with seeing that the board lays flat on the skids, or bundles, as it comes from the machine, but even though this is done, the board is liable to warp after it has been made and shipped.

Trouble with warping occurs principally in the winter, when the board is exposed to high extremes in temperature and humidity.

In transit and storage it may be exposed to temperatures ranging from below zero to 80° above and extremely high variation in humidity. We know that wood pulp is very sensitive to changes in the air surrounding it, and will swell or shrink according to the air humidity. Even though the board has been properly balanced, the edges of the skids are exposed, whilst deeper in the skid, the board is to a large extent, protected. The board should be stored away from direct currents of air.

The board should not be made too damp, as there is always the possibility that a wet streak may occur. This when piled on the skid will gradually dry out and cause a wave.

Our object should be to balance the ability of the liners to pick up an equal amount of moisture by both. If this is done, changes in the atmosphere will affect both sides of the board and thus render it more unlikely to warp.

Close cooperation between the plant and customer should be maintained with reference to plant humidity. A board made in a plant with a high humidity and stored in a dry atmosphere is almost sure to cause trouble with warping.

In the above article, an effort has been made to pass along briefly some of the experience gained during a good many years as foreman of a board machine.

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2.....LESS DOWN TIME

3.....FASTER WIRE CHANGE

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Tells how to clean your oil with . . . .

Filters and Purifiers for Oil Circulating Systems

Second of Two Parts

Part I appeared last week.

Filters

A filter is a mechanical device which acts as a barrier in the path of the oil and serves to remove the non-oil components. Filter media may be solids such as porous metal, metal screens, or composition materials; semi-solids such as paper or cloth; or loose materials in powder form such as Fuller's earth, bone-black, etc.

A wide variety of filters are available today and the proper selection depends upon full knowledge of the conditions under which such a unit will be used and the types of contaminants to be encountered. For example, the most efficient filter for a given job may have an excessively high plugging rate and would not be practical.

Filters (with exception of flat strainers) are generally composed of suitable housings and filtering elements or cells. The various types, some of which may be incorporated into a single compact unit, can be divided into four main categories.

1. Mechanical Filters.
   a. Metal screens.
   b. Edge-type filters. Cartridges of steel wool, copper ribbons, or closely packed discs of thin metal, or paper.
   c. Web-type filters.
   d. Extended area surface-type filters.
   e. Bag-type filters.

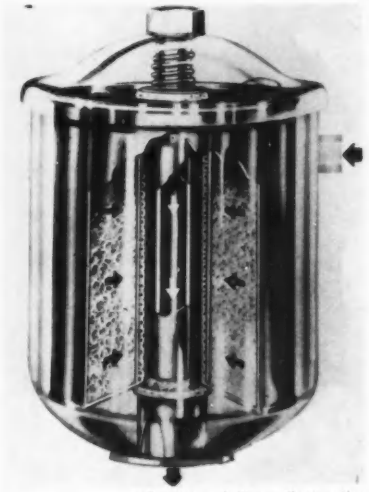
Filter in groups (a) and (b) are designed for use in pressure circulating systems and will remove coarse contaminants such as metal chips, grit, scale, etc. Insoluble oxidized material is generally not removed unless the size of the particles is sufficiently large to be caught by the filter element openings. Nor can soluble oxidized material, finely divided carbon particles, water, dust and the finer oxidized materials be removed by such filters. Some edge-type filters are made by packing cartridges with layers of impregnated cellulose discs with alternate layers of cellulose spacers or layers of metal discs with suitable spacers; the openings between the discs determining the flow rate, contaminant capacity and efficiency. Others are made by packing cartridges with metal wool or by helically winding impregnated cellulose or metal ribbon to form self-contained cylinders. Here again, the space between the metal wool strands or ribbon determines the flow rate, contaminant capacity and filter efficiency.

(c) Web-type belt filters for filtering by gravity are used in open operation for continuous removal of large amounts of bulk contaminants where heavy contamination is a major problem. This rotating type of self-cleaning filter of reinforced close woven fabric is especially useful in the machine-tool field. The rate of oil flow through such a filter will depend on the oil viscosity, web thickness and degree of contamination.

(d) The extended area filter is most generally used with internal combustion engines where only limited space is available. This type makes use of pleat-folded impregnated paper in replaceable cartridges to give the largest possible filter surface area per unit volume. These filters do not channel as do most waste or bulk-type filters. In automotive truck and tractor systems where used extensively, they are either by-pass, full-flow, or shunt connected and serve this type system very efficiency. The trend is toward the use of full-flow connection with suitable safety valves to guarantee oil feed to critical parts. For example, some automotive systems with hydraulic valve

Courtesy of General Filters Inc.

Figure 10—Cleanable all-wool felt filter cartridge over wire screen support for pressure circulating systems.



Courtesy of Fram Corporation

Figure 11 — Cut-away view of cellulose pack filter with replaceable cartridge.

lifters employ a combination full-flow by-pass system. The filter system is arranged to give full-flow filtered oil to the hydraulic valve lifters and by-pass arrangement for the rest of the lubricating system. Suitable safety valve arrangements insure oil flow at all times. The adoption of a system of this type serves to illustrate the necessity of having clean, well-filtered oil supplied to the valve lifter continuously to prevent sticking and wear and resultant loss of power, noisy operation and high maintenance costs. Usually such filters are equipped with inserts that can be replaced at intervals as they become "loaded."

(e) Bag filters of re-enforced cloth construction are used a great deal for oil conditioning and may be employed alone or in conjunction with other systems. Some systems employ a compact unit combining gravity settlers in conjunction with a series of replaceable bags. The gravity dry process permits removal of water in the precipitation chamber and sludge and solids removal in the filter bag compartment. In the precipitation compartment oil passes upwards through a series of screen trays for removal of free moisture which is automatically ejected from the bottom of this compartment. The oil overflows from the top trays into the bag filter compartment. In some systems the oil is forced into the bags from the outside by gravity and clean oil discharges from the spouts on top of the submerged filter bags. When bags clog, oil level rises indicating need for cleaning. Manufacturers prescribe materials for cleaning bags which will effectively remove contaminants without excessively weakening the bag material. Most systems of this type are designed to permit removal of individual bags for cleaning while the system is in operation. Bag filters can be used efficiently for either continuous, by-pass or batch operation.

For systems where relatively higher oil viscosities prevail, pressures of 20 to 40 p.s.i. are used instead of gravity. When the pressure drop across the filter exceeds a prescribed value, bags are to be cleaned. Metal gauze or cloth may be employed for such systems. Metal gauze may be required when systems are equipped with automatic or manual cleaning devices. Some systems employ a series of bag filters in parallel, with bags interchangeable. Removal of one set of bags is permitted while oil continues to flow through others. Use of such equipment in excessively dirty systems may require very frequent cleanings, the life of the bags being contingent upon the frequency of cleanings. Bags are fabricated usually of cotton-wool materials unless otherwise specified; synthetic fabrics such as dynel, dacron and nylon have been used successfully under some conditions to give longer life.

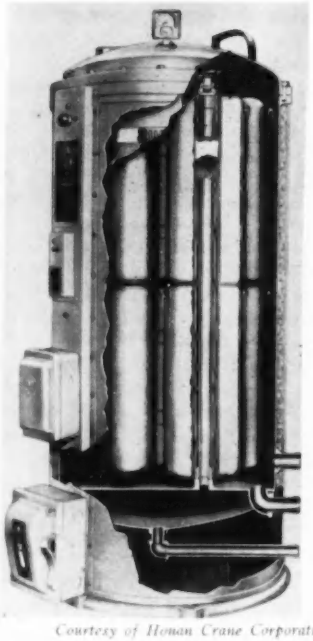
2. Magnetic Filters.

Such filters are designed for the removal of magnetic metal particles originating from wear. Their principal application is in the ferrous metals working industry. Most magnetic filters are permanent magnets, the efficiency being dependent upon the viscosity and rate of flow of the oil as well as the size of the particles to be removed. They require a minimum of maintenance and are used in continuous operation for individual units where the oil contaminant load is so great that the use of cartridge type filters alone is uneconomical.

COMPARISON OF OIL PURIFICATION AND FILTRATION METHODS IN SERVICE

	GRAVITY PURIFICATION			*FILTRATION*				
				Mechanical Filters				
	Gravity Settling	*Centrifuging*		*Bag and Pleated Cellulose Filters*	*Other Mechanical Types*	*Absorption Filters*	*Adsorption Filters*	*Dehumidifiers Vaporizers and Heaters*
		Dry	*Wet*					
FILTERING MEDIA	.....	.....	.....	Inactive	Inactive	Inactive	Active	.....
APPLICATION TO SYSTEMS								
Full Flow	No	No	No	Some	Yes	Not generally	Not generally	In some system
By-Pass	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Shunt	No	.....	.....	Some	Yes	Yes	Yes	.....
Batch	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CONTAMINANTS REMOVED								
Insoluble Solids								
Large particle size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Small particle size	No	Some[1]	Most	Yes	No	Yes	Yes	No
Insoluble Oxidation Products								
Agglomerated	Some	Most	Yes	Yes	Some[2]	Yes	Yes	No
Dispersed	No	Some	Some	Some	No	Some	Yes	No
Soluble Oxidation Products	No	No	Some	Some	No	Little	Most[3]	No
Water	Yes	Yes	Yes	Some	No	Some	Some	Yes
Water Soluble Materials	Yes	Yes	Yes	Some	No	Some	Some	No
Dissolved Gases	No	No	No	No	No	No	No	Yes
Fuel Diluent—Light	No	No	No	No	No	No	No	Yes
Heavy	No	No	No	No	No	No	No	No
Oil Additive Removal	No	No	Some[4]	No	No	No	Some[5]	No

[1] Providing particles are heavier than oil.
[2] Depending upon size of agglomerates.
[3] Depending on type of media.
[4] Those which are water sensitive.
[5] Depending upon type of additive.



Courtesy of Homan Crane Corporation

Figure 12 — Multi-cartridge refill-type depth filter for continuous operation in circulating oil systems. Employs either adsorbent or absorbent filter media.

3. Absorbent Filters.

Absorbent filters, which may be of bulk or cartridge-type, employ such materials as cotton waste, wood pulp or bark, wound yarn, nylon, felt, flannel, wool, hair, paper, mineral wool, quartz, diatomaceous earth, asbestos, etc. Absorbent filters not only remove coarse contaminants but go a step further by removing more of the finely divided insoluble oxidized materials, some moisture and some acids formed through oil oxidation. Filtration is accomplished by adhesion of contaminants to the surfaces of the filtering material and absorption by the components of the filter due to porosity. Efficiency will normally improve with use as a filter bed builds up. Excessive water contamination may materially reduce the efficiency of such units, however, and preliminary heating, vacuum moisture removal or gravity settling methods are often employed with such filters when excessive water contamination is encountered.

Depth-type filters require the oil to flow through a depth of filter medium and may be either of the replaceable cartridge or bulk type. The element itself will usually be in the form of a metal cylinder with an inner clean oil outlet tube. Oil will flow from the outside through the sock filter, perforated screen and filter depth to the outlet tube on the inside. Changes normally are controlled by noting pressure drop; excessive pressure drop indicating need for change. These can be of constant or graded density. With the latter, the density can be controlled radially and concentrically. Smaller particles therefore can penetrate to greater depths in the filter and prevent early rapid sealing of surface with resulting decreases in oil through-put. On by-pass or shunt connected systems, oil appearance can be noted or oil analysis may be required to indicate when filters have become plugged. With detergent oils, an examination of the filter itself is required to determine whether it has reached its useful life. Channelling is often encountered with some bulk type media and when such occurs, filtering efficiency is greatly diminished.

4. Absorbent Filters.

Adsorbent-type filters contain fuller's earth, bone-black, charcoal or some active type of alumina or clay. In addition to removing coarse and fine contaminants, filters of this type also remove soluble oxidized material. Since water tends to make this medium ineffective if there is much present in the oil, many adsorbent filters also contain adsorbent media or other means for removing the water. With some clay type filters, the clay may mud, pack or channel and prevent further action on the oil.

In filters of this type, oil contaminants not only adhere to the surfaces of the filtering material but also actually penetrate. This may be a disadvantage when dealing with an oil containing a chemical additive, for the filtering material may remove the polar chemical detergent, corrosive or oxidation inhibiting components. Obviously, extreme care should be observed in applying adsorbent type filters to a lubricating system. With straight mineral oils, however, they have proven very effective in increasing useful oil life.

Adsorbent type filters are available alone or in combination with absorbent and mechanical filters in a single compact unit. The units may be replaceable cartridge or bulk type. Filtering material can be procured for the bulk type so that the user can fabricate his own refills. Knowledge of how to pack these filters, however, is of utmost importance to insure against channelling in use. For high flow rates, multiply cartridge units are advisable.

The objective is to remove the harmful oil contaminants as rapidly as possible through a device as small as possible without removing oil additives, and at the same time permit adequate and uninterrupted flow of lubricant to the system.

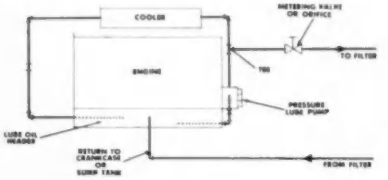
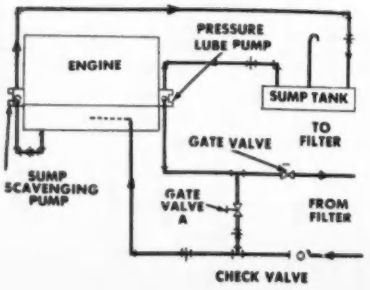
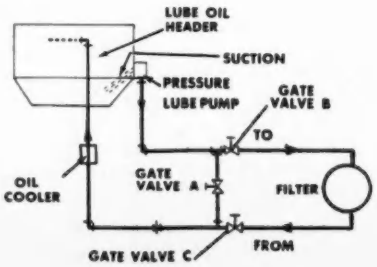


Figure 13—Top view—Typical by-pass installation accomplished by installing a tee in the line from the pressure lubricating oil pump to the lubricating oil cooler, allowing oil to by-pass to the filter through a metering valve or orifice.

Courtesy of The Briggs Filtration Co.





Filter and Purifier Arrangements in Pressure Circulating Systems

There are four commonly used methods of installation.

The *By-Pass method*, perhaps the most common, operates on only a portion of the oil in the system and takes its supply off the main lubricant line usually between the discharge pump and the lubricant cooler. The amount bypassed is generally only approximately 10 percent of the quantity of oil circulated by the oil pump and this is returned generally to the sump. By this arrangement, the lubricated area is never supplied with 100 percent purified oil.

The *Independent* System makes use of a separate auxiliary pump completely separate from the lubricating system. Here a portion of the system oil is pumped through the filter or purifier and then returned directly to the sump or crankcase.

The *Shunt* connection as used with cartridge filters allows the flow of oil from the lubricating oil pump to pass through the oil filter. These shunt type filters are equipped with relief valves. The entire flow of oil at first goes

through the cartridges. As the cartridges become saturated with contaminants, the flow of oil is divided. Part of the oil then goes through the cartridge and the balance goes through the clean oil compartment where it mixes with the clean oil which has passed through the cartridge.

The *Full-flow* connection as used with filters is identical with the shunt hook-up. Basically, the difference in the two methods is that the 100 percent flow filter must contain sufficient cartridges for a given unit to permit all of the oil entering the filter to pass through the cartridges without by-passing through the relief valves under normal operating conditions.

In selecting a filter for a circulating oil system, the question of compatibility of the oil with the filter media should be considered. Some chemical additives used in some present-day oils may not be compatible with a particular filter media under the conditions of use and may lead to unsatisfactory filter performance and/or short filter life.

Conclusion

Once it is realized that most dependable and economic lubrication will result through the selection of the most effective lubricant and the use of proper auxiliary equipment to maintain it in clean condition, the solution to the majority of lubrication problems existing in circulating oil systems today is attained. It is hoped that the foregoing will prove helpful as a guide in the selection of such equipment.

NEW LITERATURE

Graver Clarified for Separating Solids from Liquids. (Bulletin) Lists facts about Graver clarification, operational and design features. Also provides exploded photograph and schematic. Graver Tank & Mfg. Co., Inc., Clarifier Div., East Chicago, Ind.

How to Get What You Need When You Order A Valve. (Booklet) Covers selection of valve types and materials, installation and operation hints, as well as inspection and maintenance pointers. Cooper Alloy Foundry Co., Hillside, N. J.

Honeywell Resistance Thermometer Builds. (Catalogue 5701) Describes resistance thermometer bulbs of high speed, room temperature, etc. for spans as narrow as 20 F.; also wet and dry bulb resistance thermometer assemblies for measurement of relative humidity. Minneapolis-Honeywell Regulator Co., industrial Div., Wayne & Windrim Avenues, Philadelphia 44, Pa.

Jeffrey Swing Hammer Shredders and Wood Hogs. (Catalogue 855) Provides illustrated sales copy on complete line and 8-page insert consolidating technical data on Jeffrey shredder line. Jeffrey Mfg. Co., 938 N. 4th street, Columbus 16, Ohio.

Jerguson Water Columns. (Data Sheet) Gives principles of operation of Unit 232 which replaces 142. Also includes diagrams of action at normal, low and high water level, accessories and the camshaft mechanism. Jerguson Gage & Valve Co., 87 Fellsway, Somerville 45, Mass.

Wheelco Instruments. (Condensed Catalogue) Describes complete line for industrial process control application. Discusses Wheelco electronic link, simple no-contact linkage between precision, direct measuring unit and automatic control and recording system. Also includes brief description of Flameotrol for oil and gas burners. Wheelco Instruments Div., Barber-Colman Co., 1300 Rock street, Rockford, Ill.

Bibliography of Technical Reports. (February Bulletin) Covers 34 engineering reports on methods for cooling electronic equipment, including cooling by use of cabin exhaust air, design of blowers and tubular heat exchangers and series of studies of microwave components and diffraction; also chemicals, communication, equipment, physics, etc. Price 60c per copy. Yearly subscription $6.00. Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C.

Crucible Rezistal Stainless Steel Selector. (Slide Rule-Like Chart) Answers question of exactly what type of stainless steel should be used for about 95 per cent of operations. Front contains comparison of stainless physical and mechanical properties and elevated temperature properties. Reverse side gives large number of important characteristics of stainless. Crucible Steel Co. of America, Box 88, Pittsburgh 30, Pa.

Coffing Quik-Lift Electric Hoists. (Bulletin) Includes performance and safety features, cut-away drawings showing details of construction, complete specifications and dimensions of all 17 models from 500 to 4,000-lb. capacities; also pictures and descriptions of various electric hoist accessories. Coffing Hoist Co., 800 Walter Street, Danville, Ill.

Ideas On Paper—Three. (Review) Contains 17 specimens of fine printing and art techniques, and points up important role played by paper. Production data is given on each item included. Alling & Cory Co., 25 Verona Street, Rochester 2, N. Y.

Knight Fume Washers For Corrosive Service. (Bulletin 9) Provides cross section drawing of typical fume washer, construction details, operating principles, engineering drawings of three types, and list of types of typical jobs, including removal of dust from exhaust gas and removal of chlorine fumes. Maurice A. Knight Co., Kelly Avenue, Akron 6, Ohio.

Multi-Amp Takes the Guess Work Out of Electrical Protection. (Catalogue 154) Describes versatile line of portable high current test instruments. Also includes illustrated sales copy, list of indicated uses and industrial applications. Multi-Amp Corp., 10 Third Street, Newark, N. J.

New Product Bulletin, Collective Volume III. (159p. Booklet) Offers detailed technical data on Acrylamide, 3-Aminopropanol, N-tert-Butylacrylamide, N, N-Diallylmelamine, Guanamines, 3,3'-Iminobispropylamine, Surface Active Agents TR and BPE, etc. American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.

Rowe Hydraulic Adjustable Loading Ramps. (Brochure) Details complete line of hydraulic adjustable loading ramps. Also contains illustrations, design and construction features, engineering diagrams and application information. Rowe Methods, Inc., 2534 Detroit Avenue, Cleveland 13, Ohio.

Steam Hose Applications. (Bulletin) Covers every application of steam hose. Also includes performance data, sizes, weights, working pressures, couplings best suited for specific uses, cross section and cutaway photo of different types of construction. Quaker Rubber Corp., Div. H. K. Porter Co., Inc., Tacony & Comly streets, Philadelphia 24, Pa.

Waldron Research Facilities. (Bulletin 1016) Describes new laboratory and equipment available to prospective customers for use in product development and determining suitability of particular machinery to manufacturing or converting operations. Tests of one or two days duration can be scheduled by advance reservations. Of particular interest to the paper industry. John Waldron Corp., P. O. Box 791, New Brunswick, N. J.

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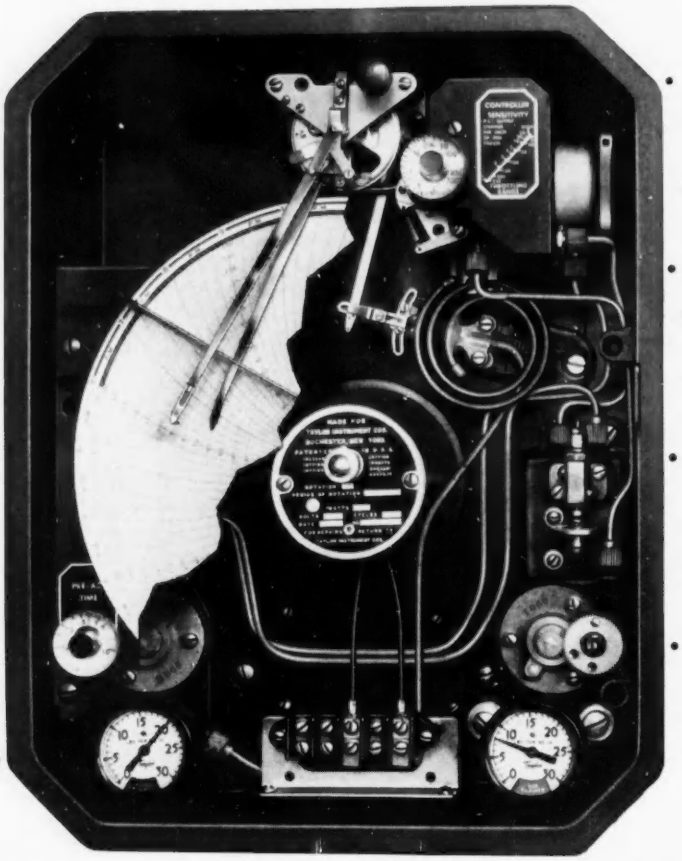

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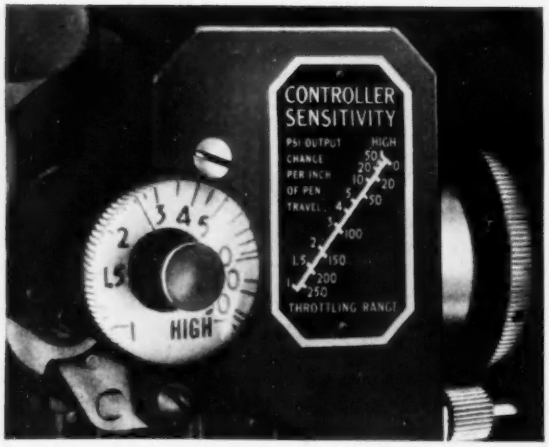
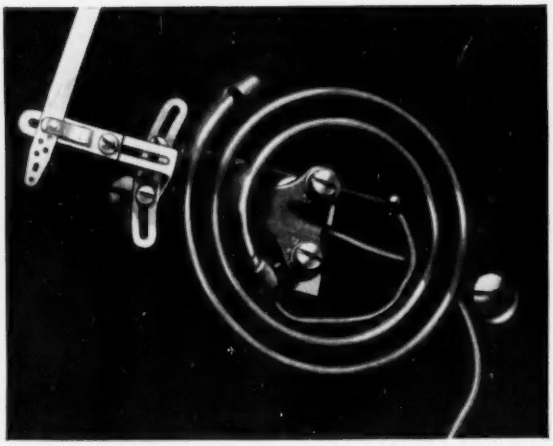
Single Duty FULSCOPE Recording Controller with Adjustable Sensitivity, Automatic Reset and PRE-ACT responses. Double Duty control mechanisms, with *any* combination of control responses, afford a great advantage on many applications.



Sensitivity adjustment unit; single, continuous adjustment calibrated in specific units.



Improved sub-base permits easy, precise replacement of pre-calibrated actuating systems in field.

FAVORITE FOR 15 YEARS

. . . the Taylor Fulscope® Controller

THANKS to you, the Taylor FULSCOPE Controller today enjoys unrivaled popularity. We say thanks to you because this instrument was designed to meet your exacting requirements as determined by an industry-wide survey. The result is dependable performance year after year, and low maintenance cost. In the paper industry, from pulp grinding to paper finishing, these instruments are relied upon to operate automatically for hours on end unattended. Thus the operators are freed to take care of other maintenance duties.

For the benefit of those who are new in positions of responsibility in the selection of instrumentation, here are some of the reasons why Taylor Series 100 FULSCOPE Controllers have been able to meet these exacting requirements and consequently reign supreme throughout industry.

ADAPTABILITY

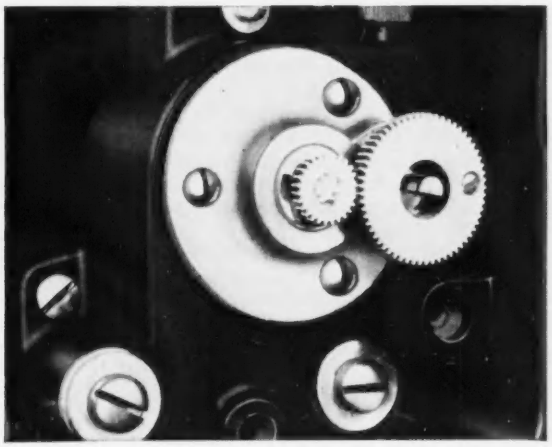
1. Extremely versatile. The same control mechanisms are available for Temperature, Pressure, Flow and Liquid Level—in either recording or indicating models, as locally mounted controllers, transmitters or controlling receivers. Interchangeable unit construction permits a small inventory of parts. Pre-calibrated units eliminate expensive checking. Easy visibility and accessibility of components means an instrument man can have a unit back on the job with minimum down time.

2. Adaptable to any control problem because the FULSCOPE Controller has three control effects:

(a) Proportional Response—available in three forms: Fixed High Sensitivity (1000 psi per inch pen movement): Adjustable Sensitivity (1000 to 1 psi); and Limited Range Sensitivity (400 to 30 psi). **(b) Automatic Reset Response,** completely and continuously adjustable (.05 to 5 repeats per minute). **(c) PRE-ACT* Response** (rate action) continuously adjustable within the range of 0.2 to 10 mins. All the adjustments are wide range and continuous. Any combination of these control responses may be used to provide any required quality of control. PRE-ACT and reset units are interchangeable.

3. Proper Adjustment Easily Obtained. Control Response Adjustment Dials are calibrated in specific units, repeatable in all instruments. Optimum settings are quickly determined.

4. Controller action simply changed by lifting a spring clip and rotating set-point knob.



Interchangeable needle valves in Automatic Reset and PRE-ACT units.

DEPENDABLE OPERATION

5. Control point always matches set point when automatic reset is used, thanks to fully pneumatic sensitivity reduction. Lowering sensitivity for stability does not reduce the effectiveness of the reset response. Result—control point always returns to set point, regardless of load changes.

6. Trouble-free air system. Metal disc type filters are built-in features, easily removed for cleaning. Both relay air valve and nozzle are made of 18-8 stainless steel. A simple system, made of corrosion resistant parts, easily accessable for cleaning.

7. Lifelong Accuracy. Fewer links and pivots. Dead spot and hysteresis practically non-existent due to lightweight stainless steel link and small diameter burnished pivots. This lightweight construction nullifies vibration effects. Spring pivot clips, which do not gum up or corrode, replace screws. Over and under-range linkage protection provided when required.

Whether your processing problems are simple or complex, there's a Taylor instrument or control system and a competent Taylor Field Engineer ready to help you solve them.

Write for Bulletin 98151. Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.

*Trade Mark

Taylor Instruments
MEAN ACCURACY FIRST

What Waste Paper Requirements Will Be in 1954, and WHY

Jacob Baker

The Econometric Institute Inc.

Highlights

- Supply of most Waste Paper Grades is well above demand.
- Research for new uses is the solution to the perennial oversupply of waste paper's development.
- Greatest strength for waste paper demand will be in papers and non-packaging paperboards.
- Greatest weakness in waste paper demand will be jute boards.

Editorial Note: We believe Mr. Baker's outlook for 1954 is more pessimistic than present facts warrant.

This extract from an address before the Waste Paper Institute discusses the outlook for waste papers and where and why they fit into our board and paper economy.

Waste paper requirements in 1954 will probably total about 8 million tons. This will be more or less in line with the 1950 and 1951 levels, but somewhat below the highs established in 1951 and 1953. Potential waste paper supply will be fully adequate to meet requirements. In fact, supply of most waste paper grades may be well above demand throughout 1954.

The demand for waste paper depends upon (1) the level of activity in end-use industries and (2) the rate of growth in consumption of waste paper within each end-use industry. The major end-use industries are: (1) paperboard; (2) paper; (3) building paper and paperboard; and (4) miscellaneous uses (e.g., filler in packaging or insulating material, such as in frozen food boxes). For the most part, the rate of growth of consumption of waste paper within each of these industries has been steady to downward during the past ten years or so.

Last year paper manufacturers used about 1.1 million tons of waste paper in producing 11.4 million tons of paper. Waste paper's share of this market has been relatively stable at about 10 or 11 percent of the total raw materials used. In 1951 the paper industry used 1.3 million tons of waste paper, which was 12 percent of the total raw materials consumed. That year was, however, more like a war-time than a peace-time year: prices of overseas wood pulp were just about twice the price of domestic pulps, and the demand for paper and paper products was very intense. The 1952-1953 experience was closer to the norm.

Paperboard

Some decline in the consumption of waste paper by the paperboard industry may be expected during 1954. Last year the paper industry used 6½ million tons of waste paper in producing 12.4 million tons of paperboard. Production of paperboard this year will probably fall below 12 million tons, and waste paper requirements may be down to 6.2 million tons.

The most important user of waste paper in the paperboard industry is the boxboard manufacturer. A large part of the furnish of folding boxboard consists of waste paper; set-up boxboard is practically all waste paper. Both set-up and folding boxes are used mainly to package products in the consumers' non-durable goods category. Therefore, demand for folding and set-up boxes tends to change more slowly than total industrial production. In the recent boom in total industrial, the increase in boxboard production was relatively mild. Similarly, in the present downtrend, the decline in folding boxboard will probably be relatively small. The total decline in waste paper requirements by the boxboard industry in 1954 is likely to be about 8 percent from the 1953 level.

Next to boxboard, the major use of waste paper by the paperboard industry is for the production of miscellaneous paperboard products; that is, paperboard for hundreds of non-packaging uses, such as advertising display posters, cardboard, etc. Production of paperboard for miscellaneous uses has been growing more or less steadily since the end of World War II. Last year a new high was established in production of these items. It is very likely that the strong growth trend will act to offset most of the impact of declines in over-all industrial activity, so that production of miscellaneous paperboard items in 1954 will remain close to the 1953 total. Since these products are made almost entirely from waste paper, demand for waste paper by this segment of the paperboard industry is likely to remain steady during 1954.

At one time (about 20-25 years ago) paperboard shipping containers were made almost entirely from waste paper. With the development of the kraft pulp industry in the Southern states, using Southern pine for pulpwood, more and more shipping containers were made from kraft paperboard. Just before World War II, more than half of the total volume of containerboard produced was made from waste paper or some fiber other than wood. Last year only about one-fourth of the total volume of containerboard consisted of some fiber other than wood. The demand for jute (waste paper) liners today is essentially marginal in nature. That is, when demand contracts, jute liners feel it first and hardest; when demand expands, requirements for jute liners quickly rebound. This year demand for containerboard is contracting. The net result may

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Low initial investment cost, reduced space requirements and the simplicity of this efficient process are other advantages which recommend its use in small and medium-size mills.

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be as much as a ten percent decline in demand for waste paper by this segment of the paperboard industry. In fact, this market, (about one-seventh of the total) is perhaps the weakest and most vulnerable of any waste paper market.

Building Papers and Boards

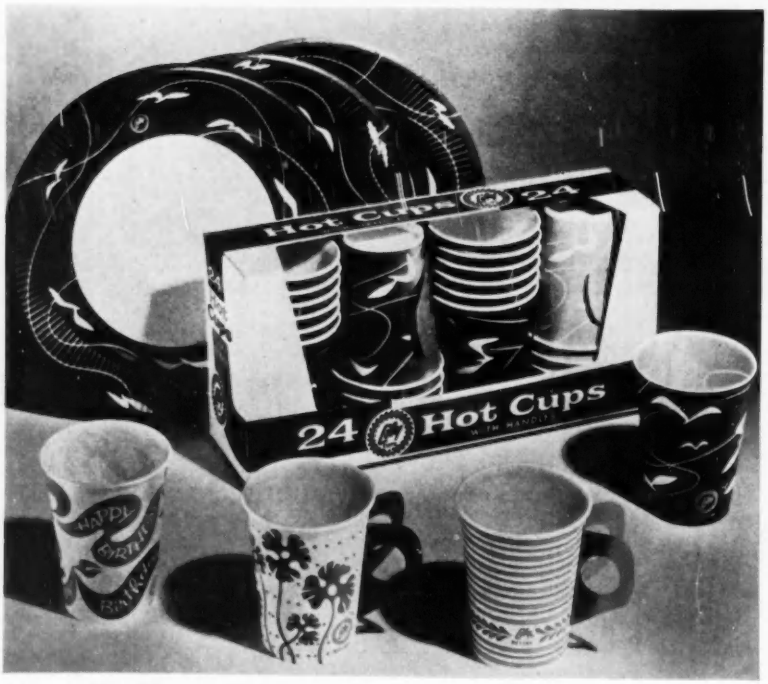
Some weakness is also likely in the demand for waste paper for the production of building paper and building board. This industry has been using roughly 750 thousand tons of waste paper per year, mostly for the production of building paper. The demand for building paper and building board tends to move in line with demand for total building materials, of course, moves in line with the total volume of construction put in place. In general, construction activity is lessening. Those segments of the construction industry which are expanding (e.g., highway construction) do not use either building paper or building board. On balance, the demand for waste paper for production of building paper and building board will probably be 5 percent under the 1953 total in 1954.

New Uses

We have no data on the consumption of waste paper for miscellaneous uses. Nevertheless, I would like to point out that the successful development of new uses for waste paper will go far toward alleviating the perennial problem of an over-supply of waste paper. There is a definite limit to the total volume of waste paper that can be reclaimed from the 30 million tons of paper and paperboard consumed in this country each year. This limit is probably no higher than 13 or 14 million tons.

The basic problem facing the waste paper industry is to find uses for that additional tonnage and bring demand up to the level of the supply potential. With nearly 20 million tons of virgin fiber used each year in the domestic production of paper and paperboard, the quality of waste paper collected in this country can be very high. Research aiming at the development of new uses is certainly the most promising line of attack on the basic problem of this industry.

In sum, the demand for waste paper in 1954 will probably recede only a little from the relatively high level of 1953. Major areas of strength will be in the paper industry and in the demand for waste paper for non-packaging paperboard products. Demand for waste paper by the jute board industry will probably show the greatest weakness among the various end-use industries. Possibly the best solution to the problem of the huge potential over-supply of waste paper lies in developing enough new uses to absorb about 4 million tons of waste paper per year.



Lily-Tulip's New Resale Line

Lily-Tulip Cup Corp. is marketing a complete resale line of paper cups, plates, frozen food and food storage containers for the retail market. Much of the line is packaged in Fulvue window boxes in units ranging from 15 to 200 units for easy selection and impulse buying. Cellophane-wrapped units of 6 and 10 cups will be continued.

Product improvements include plastic coating for efficient serving of moist foods with gravies. Hot-drink cups come equipped with firm comfortable handles. Cold cups are especially treated for use with alcoholic beverages.

In the frozen food container line, two Fulvue packages of Oken Buckets are added in counts of 12 pints and 8 quarts. Offered in the tapered design which facilitates even freezing.

New Fulvue packages of all-purpose food cups also are offered for storing leftover foods in the refrigerator, preparing lunch boxes, serving desserts and side dishes.

Now distributed on a nation-wide scale, the new cup, plate and container line marks the re-entrance of Lily-Tulip into the consumer market.

Six K-C Mills Get Safety Awards

Certificates of achievement have been awarded to six mills of the Kimberly-Clark Corp. by the National Safety Council, for reducing their accident frequency rates to well below the average in the industry. The mills are at Neenah and Kimberly, Wis., Niagara Falls, N.Y., Memphis, Tenn., Coosa River, Ala., and Kapuskasing, Ont.

A Veteran Reader Retires

Gentlemen:

After some thirty six years in the paper industry I am retiring.

When my present subscription to the Paper Trade Journal expires I will not be renewing it. I want you to know however that I have enjoyed it these many years.

In winding up my connection with the industry I want to get two of the books that you advertise. They are as follows:

Practical Paper Technology Wm. Bond Wheelright	$3.00
The Progress of Paper assembled by your Staff	6.00
	$9.00

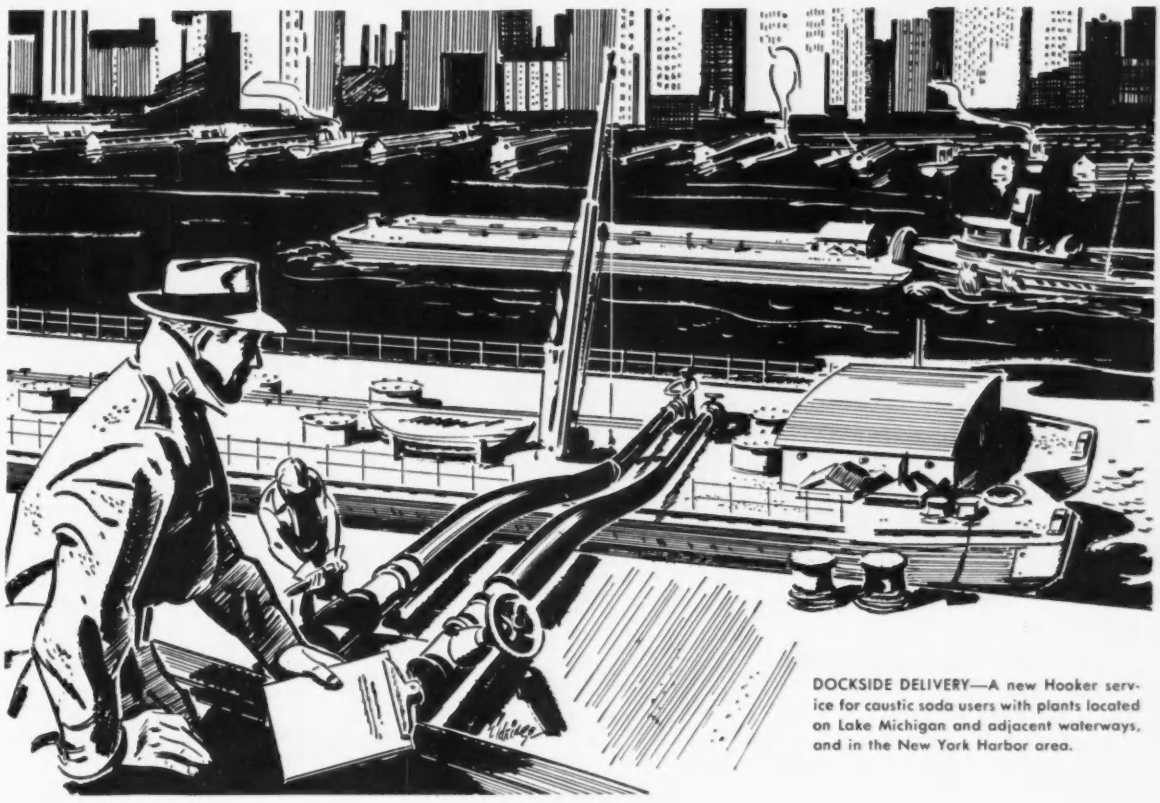
Please mail the books to me at the following address.

Mr. Kimberly Stuart
Gardnerville, Nevada.

Yours very truly,
Kimberly Stuart

P.S. I want to commend your advertising "Hand Made Paper in Japan." It is a beautiful thing and I am glad to have a copy.

Mr. Stuart is a director of Neenah Paper Co.



DOCKSIDE DELIVERY—A new Hooker service for caustic soda users with plants located on Lake Michigan and adjacent waterways, and in the New York Harbor area.

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Forms: Liquid 50% and 73% • Flake • Solid • Special fine flakes

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Name..... Title.....

Company.....

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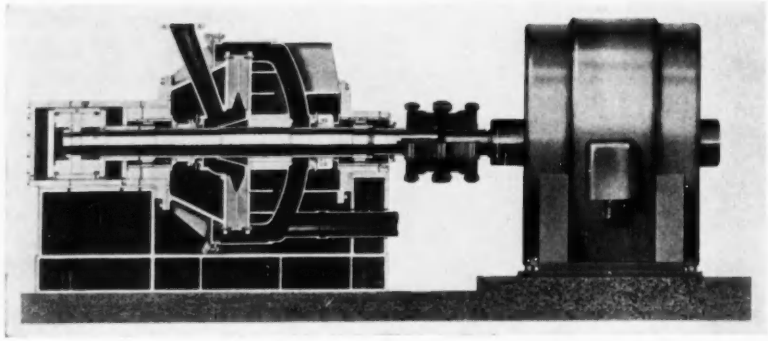
NEW EQUIPMENT AND SUPPLIES



Stock Preparation Disc Refiner With Pressure Feed and Discharge

The Bauer Refiner No. 440 is a new revolving disc mill for stock preparation service. Made by Bauer Bros. Co., 1758 Sheridan Ave., Springfield, Ohio, the unit is said to be designed for feeding and discharge under pressure.

The refiner has a rotating 44" disc driven through coupling by any standard slow speed motor (usually 400 to 514 r.p.m.) in the range of 450 to 750 hp. The frame is of welded steel construction. Both the stationary and rotating discs are fabricated to achieve rigidity without excessive weight. All parts of the refiner in contact with stock are of stainless steel. The revolving head or disc is suspended between two bearings, thus insuring vertical positioning, it is said, even though the shaft should deflect slightly. The working surfaces of both heads are provided with replaceable segmental plates of white iron, stainless iron, or stainless steel depending on the type of refining required.

Roller bearings are normally used for radial loads, while the thrust is carried by a Kingsbury bearing. A circulating oil lubricating system is built into the machine.

The thrust bearing is incorporated in a piston which in turn is contained in a cylinder supported by the frame. The head-shaft-piston assembly is moved longitudinally by an oil system equipped with a pressure regulator. Normally, the oil system will pull, not push, the rotating elements against the stationary head, keeping the shaft in tension.

The revolving head is totally enclosed in a chamber designed to withstand pressures up to 100 p.s.i. The refined pulp is discharged from this chamber through a pipe line provided with a flow meter and an ordinary stock valve to control the flow of pulp by throttling. (Only one control valve and one flow meter are required for two or more refiners operated in series.) When the refiner is operated, the motor is started and stock is admitted under pressure through the feed pipe which delivers into the center of the stationary disc. Stock consistency is preferred in the range of 4 percent to 6 percent, but the machine is effective at both higher and lower densities, it is said.

The volume flow through the unit is regulated by the stock valve on the discharge line, using the flow meter as a guide. The flow reading multiplied by the stock consistency figure will indicate the tons per day being treated.

Then, by means of a ¼-inch valve, oil is admitted through the pressure regulator to the thrust bearing cylinder, pulling the rotating disc up toward the stationary head. When a suitable power meter indicates that the motor is properly loaded, the control on the oil pressure regulator is locked in place. The machine needs no further attention until, for any reason, the stock needs more or less refining.

According to the manufacturer, this new disc refiner was field tested 24 hours per day for a period of six months in a commercial kraft board mill.

For the complete preparation of kraft for container board, from raw pulp to machine furnish, the manufacturer says exhaustive tests have shown that this refiner will require about 160 kw-hr. per ton (bone dry basis) of kraft paper. This means that the refiner, equipped with a 750 motor, will accomplish the complete preparation of kraft board furnish at the rate of 100 tons of product per day.

The "pump-through" feature of the unit is said to adapt it to continuous refining and series operation without intermediate chests and with only one pumping. (The pressure on the discharge side of the disc exceeds the inlet pressure.) The machine can be operated in series with others of this type or, in connection with jordans, it can precede or follow the jordans. If desired, it can discharge a measured flow directly to a regulating box.

Polyvinyl Chloride In Weldable Sheets

Atlas Mineral Products Co., Mertztown, Pa., has made available Type I and Type III, non-plasticized polyvinyl chloride sheet in various thicknesses measuring 9 feet x 4 feet. These heat weldable products are supplied in standard thicknesses ranging from 10 thousandths of an inch to 2 inches.

Type I, described as the optimum chemical resistant sheet, is supplied in black color under the trade name Ampcoflex. Type III, described as the optimum impact sheet, is supplied in grey color under the registered trade name Pee Vee Cee.

Welding rod for fabrication of structures is available to trained plastic welders. Fabricated ductwork, extruded pipe, fittings, valves and other injection molded non-plasticized polyvinyl chloride parts are also available, it is said.

Seamless Tubing Steel For Severe Applications

An alloy steel designed for use in equipment operating under conditions involving high stresses and temperatures, is now available in seamless tubular form from Tubular Products Div., Babcock & Wilcox Co., 161 E. 42nd St., New York, N. Y. Produced by the hot extrusion process, this Universal Cyclops Uniloy 19-9DL Alloy seamless tubing is obtainable in a limited size range. It will be marketed as Croloy 19-9DL.

Predominantly austenitic stainless steel (containing chromium, nickel, molybdenum, tungsten, and small quantities of columbium, tantalum, and titanium), the material is said to have good strength at temperatures up to 1200 degrees F. It is corrosion resistant, having characteristics similar to high-carbon, 18 per cent chromium, 8 per cent nickel stainless steel.

In comparison tests with other stainless steel, this material, showed the following resistance to oxidation at 1200 degrees F., according to the company:

Steel	*Oxidation Rate-Inches Penetration/Year*
19-9DL	.0008
309	.0030
317	.0017
446	.0001

Charpy impact strength of the ma-

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STAINLESS OR HIGH ALLOY TUBING

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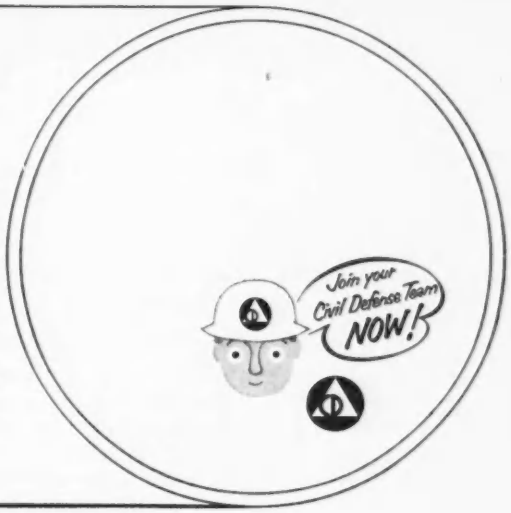
Whether you're an engineer who wants technical information in a hurry, or a new user of tubing looking for the full story of stainless and high-alloys, you'll find this booklet equally valuable.

In it, discussed by classification, you'll find data on pressure, sanitary, mechanical, heat-resistant, ornamental and other forms of stainless and high-alloy welded tubing. There are engineering data on joining methods, welding techniques, bending and installation hints. Also included are complete tables of bursting pressures, physical and chemical properties of stainless steels and other alloys, and corrosion and temperature data. This is only a partial list of contents, but it will give you an idea of the wealth of pertinent, factual information the booklet contains.

To get your free copy, just drop us a note on your company letterhead. There is no obligation, of course.



TRENTWELD

STAINLESS STEEL TUBING

TRENT TUBE COMPANY, GENERAL SALES OFFICES, EAST TROY, WISCONSIN (Subsidiary of CRUCIBLE STEEL COMPANY OF AMERICA)

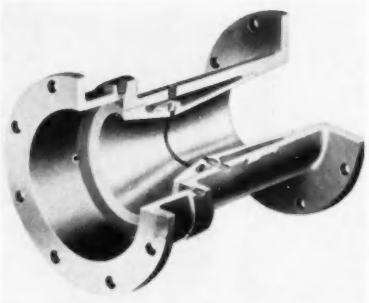
terial is in the neighborhood of 46 foot pounds at 80 degrees F. and 56 foot pounds at 1200 degrees F.

Further strength test are said to show the following stress rupture and creep values at 1200 degrees F.:

Time to Rupture	*Stress*
10 hours	50,000 p.s.i.
100 hours	44,000 "
1000 hours	37,000 "
10,000 hours	31,000 "

And, stress for secondary creep rates:

Creep Rate	*Stress*
.01% per 1000 hours	9,800 p.s.i.
.10% per 1000 hours	19,500 p.s.i.



Conical Flow Tube Meters Gases & Liquids

Builders-Providence, Inc., Division of B-I-F Industries, Inc., 345 Harris Ave., Providence, R. I., is marketing a new device known as the Dall Flow Tube for metering liquids and gases. The flow tube is designed for use with gases and liquids carrying no settleable solids. It consists of a short, flanged, cylindrical body designed with an abrupt decrease in diameter, followed by a conical restriction and diverging outlet.

The reduced area at the cone entrance together with the design of the annular throat induces the high differential pressure obtained; the diverging outlet cone provides the high recovery of differential pressure, it is said.

Some of the features of the flow tube are described as low permanent head loss, short length and low weight to provide for easy installation. Meehanite iron body, corrosion resistant bronze liner, unobstructed flow path. Technical data is available from the manufacturer.

Ferguson cuts costs by Methods Studies and Controls

Here's how Ferguson maintains Methods Studies and Controls on the job, similar to those used by manufacturers in production. Every construction project is broken down into its component parts before work is started. Each unit is then analyzed and studied to make certain that the equipment and practices used will accomplish the work faster and at the lowest possible cost. Actual construction costs are continually reviewed, and control of the work is so maintained that expenditures are held within or under predetermined appropriations.

Our engineers and consultants will be glad to show you how these practices can be applied to your pulp and paper expansion program.

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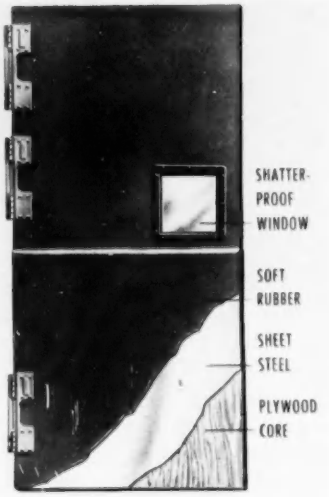
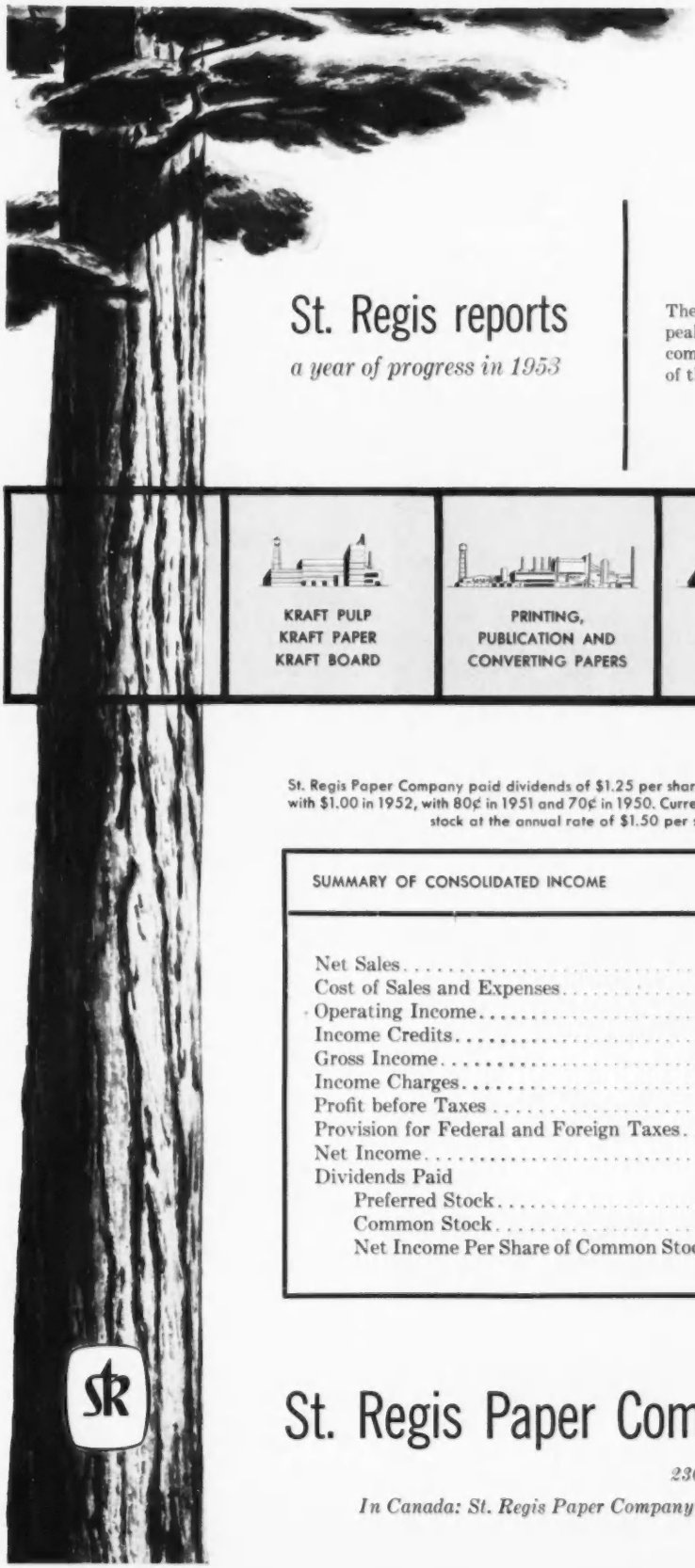


Steel & Rubber Armored Bumper Doors

Designed to absorb deliberate bump opening by fork trucks, etc., a factory access door of plywood, steel reinforcing, and soft rubber sheathing is now available from American Hard Rubber Co., 93 Worth St., New York 13, N. Y. Known as the Durador, the door is said to eliminate the need for automatic door opening devices.

Some advantages of the door claimed by the manufacturer are its resistance to corrosive atmospheres, its rigid hang insuring a tight closure, and its simple maintenance.

The door hinges are set to span more than half the door length and are located so that impact on the bottom of the door is dynamically counteracted. The rubber sheath is ¾ inches thick. The windows are shatter-proof Lucite.



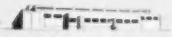
St. Regis reports

a year of progress in 1953

The annual report shows net sales at a new peak for the company at $200,334,208, compared with $182,712,239 in 1952. A copy of the report is available upon request.

KRAFT PULP
KRAFT PAPER
KRAFT BOARD

PRINTING,
PUBLICATION AND
CONVERTING PAPERS



MULTIWALL BAGS

ST. REGIS PANELYTE

...AND NUMEROUS PAPER SPECIALTIES

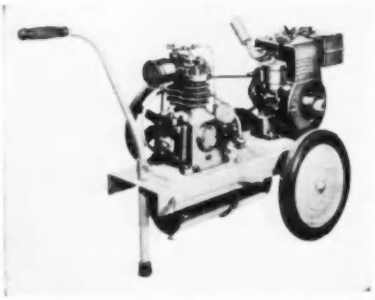
St. Regis Paper Company paid dividends of $1.25 per share on the common stock in 1953, as compared with $1.00 in 1952, with 80¢ in 1951 and 70¢ in 1950. Currently dividends are being paid on the common stock at the annual rate of $1.50 per share.

SUMMARY OF CONSOLIDATED INCOME	For the years ended December 31, 1953 and 1952	
	1953	1952
Net Sales	$200,334,208	$182,712,239
Cost of Sales and Expenses	173,076,318	158,165,799
Operating Income	27,257,890	24,546,440
Income Credits	4,652,303	1,135,723
Gross Income	31,910,193	25,682,163
Income Charges	2,547,083	1,441,788
Profit before Taxes	29,363,110	24,240,375
Provision for Federal and Foreign Taxes	13,206,207	11,538,398
Net Income	16,156,903	12,701,977
Dividends Paid		
Preferred Stock	664,660	693,308
Common Stock	6,550,449	5,170,714
Net Income Per Share of Common Stock	2.91	2.32

St. Regis Paper Company

230 Park Avenue, New York 17, N. Y.

In Canada: St. Regis Paper Company (Canada) Limited, Montreal



Portable Air Compressors

A new line of portable air compressors in a variety of models has been introduced by the DeVilbiss Co., 300 Phillips Ave., Toledo 1, Ohio. Designed for spray painting is a one horsepower model, rated at 60 pounds maximum pressure and delivering 5.4 c.f.m. of air. For general utility work, one-half and one horsepower compressors are offered, both having 100-pound maximum pressure ratings. The one horsepower unit delivers 4.2 c.f.m. of air and the one-half horsepower model has an output of 1.91 c.f.m., it is said.

All compressors are available with either electric or gasoline motor as power source. The compressor and motor are mounted on a chassis that has two large diameter wheels with rubber tires. A removable handle is provided to guide the unit.

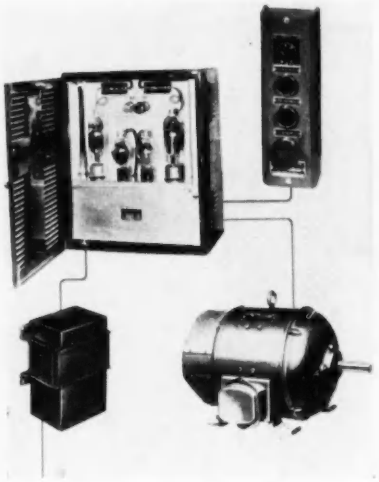
Air taken into the compressor is filtered to prevent entry of dirt or dust. All models are automatically oiled by a ring type oil pickup and centrifugal force. The units have directional fins for uniform cooling with a flywheel to supply a continuous blast of air.

Other features of the compressor claimed by the manufacturer are a balanced forged crankshaft; quick acting, quiet valves; easy valve inspection; forged connecting rods and automatic unloader. The compressors are equipped with an air tank to eliminate pulsation of delivered air and to collect moisture. The tanks have a drain valve.

The year 1954 sees Lindsay enter upon a second half century of service to the paper industry. We pledge our utmost effort towards making that period more and more resultful.

THE LINDSAY WIRE WEAVING COMPANY
CLEVELAND 10, OHIO

LINDSAY WIRES Since 1903
FOR PAPER MANUFACTURING



Stepless Adjustable Speed Drive Unit

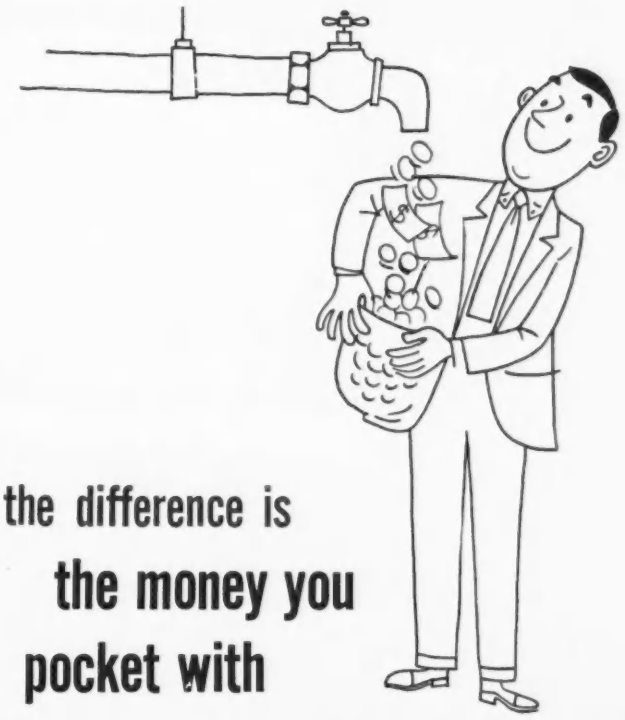
Electronic Select-A-Spede is the name of a new stepless adjustable-speed drive now being sold by Louis Allis Co., Milwaukee 7, Wis. It is designed for operation from a.c. power lines and is available with d.c. drive motors in standard NEMA frame sizes, ¾ to 15 hp.

The manufacturer claims that the drive offers precision speed control, wide speed range, adaptability to a variety of optional electrical and mechanical modifications, and new simplified electronic circuits.

It can be supplied with speed ranges of 5:1, 20:1, or 50:1, and for special applications, 100:1. It is said that the regulation of the unit with tachometer feedback equipment will be plus or minus ½ percent.

The complete package consists of an anode transformer, electronic control panel, pushbutton station, and adjustable-speed d.c. drive motor in any desired style of enclosure.

Descriptive bulletin No. 1500 is available from the manufacturer.



the difference is the money you pocket with Cyanamid's LIQUID ALUM

Specify Cyanamid's Liquid Alum and pocket money from these savings . . .

Savings in Cost

based on solids content, *liquid* alum can be delivered at a lower price than dry – because of fewer steps in its processing

Savings in Handling

no manual unloading, hauling, storing – the pumps and the pipes do the work

no intra-plant distribution labor, no mess, no dust, no clean-ups

Savings through Efficiency

you meter Cyanamid's Liquid Alum directly and accurately into the beater or hydrapulper – no guesswork, no risk of spillage

Send for Cyanamid's free booklet, *Alum–Commercial Aluminum Sulfate,* containing valuable information on alum and a diagram of a typical liquid alum system.

Recent Mill Developments in Cyanamid Paper Chemicals...

INCREASED WET-STRENGTH EFFICIENCY is credited to Sodium Phospho Aluminate when used in conjunction with PAREZ® Resin 607. One mill experience in the Great Lakes area shows that wet strength is increased as much as 10% when 0.2-0.4% of SPA is added to the beater.

* * *

UNUSUALLY GOOD SIZING RESULTS are reported by a Pennsylvania mill using CYFOR® Dry Dark fortified size. After switching to CYFOR, this mill obtained a 17% reduction in water absorption as measured by the Cobb test.

* * *

CONSIDERABLE SAVING IN A LARGE-SCALE COATING operation is credited to the replacement of stearate by ALWAX* Size 204-A. The Wisconsin mill noted that the increase in viscosity was less pronounced than with stearate, and that the smoothness of the coated paper was just as good as that obtained by using 6% stearate. These results were secured at considerably less expense.

* * *

IMPROVED PICK TEST ON OFFSET PAPERS was achieved by the use of 0.25% of PAREZ Resin 607 added at the sand trap. This was made standard procedure at this midwest mill, which also reports no broke reclamation problem due to the small amount of resin involved.

*Trade-mark

THE LARGEST VARIETY OF PAPER CHEMICALS, *to serve every industry need, is offered by Cyanamid, and is backed by the services of technical experts with years of practical mill experience.*

AMERICAN Cyanamid COMPANY

PAPER CHEMICALS DEPARTMENT

30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

Sales Offices: Boston • Charlotte • Chicago • Cleveland • Kalamazoo • Los Angeles • Mobile • New York • Philadelphia • Seattle
In Canada: North American Cyanamid Limited, Toronto and Montreal

The DRAPER Belt
DRAPER BROTHERS COMPANY
CANTON, MASS.

Live Roller Conveyor Adjustable By Sections

A powered roller conveyor for horizontal handling of materials over long distances is now available from Rapids-Standard Co., Grand Rapids 2, Mich. Known as Rapistan LR Live Roller conveyor, it is said to handle materials varying widely in shape and weight and to allow inspection, labeling, or weighing of the packages without interference with the flow at any other point along the line.

The conveyor has carrier rolls and pressure rolls mounted in the same frame. A motor-driven belt runs between the two sets of rolls, activating the upper carrier rolls to move the materials along. In each five-foot section, the pressure rolls under the belt may be adjusted up and down at any point to provide proper belt contact for straight carrying, accumulated loading, or sweep-on-sweep-off operations, it is said.

The drive and take-up units are separate packages which can be mounted at any point on the under flange of the conveyor frame. Each carrier roll rides in die-cut slots, permitting them to pop out and thus prevent injury should clothing or fingers of the operators be drawn between the rolls and drive belt.

The conveyor is supplied in ten-foot lengths and in a range of eight frame widths from 15 to 39 inches. Standard roll speed is 80 feet per minute. Other speeds can be arranged from 60 to 200 f.p.m. Weight capacity of the individual rolls is 250 pounds.

Subminiature Selector Switches

A new series of subminiature rotary selector switches and a new two-circuit double-break basic switch are now available from Micro Switch, Div. of Minneapolis-Honeywell Regulator Co., 4510 Wayne Ave., Philadelphia 44, Pa. These selector switches are said to offer a means of switching as many as eight different circuits with one assembly. They are available with from two to eight switching units and from two to eight detent positions, with a 45-degree angle between detents.

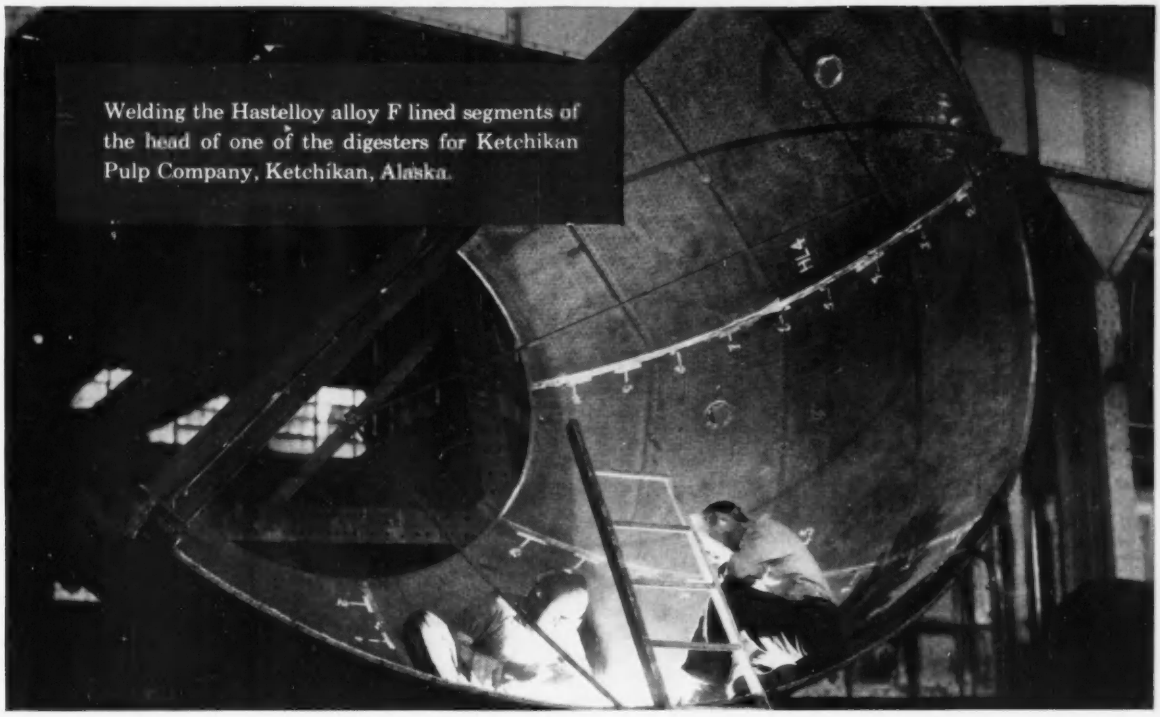
The rotary selector switches are panel-sealed, and the eight-switch assembly requires only a 1-17/64-inch diameter mounting surface and its over-all length is less than four inches. In the eight-switch assembly, four switches can be wired normally open and seven normally closed, and so on. The switches are available with drilled, solder type terminals, or rap-around type, turret terminals. They are rated for an inductive load of 3 amperes at 30 volts d.c. and 10 amperes at 125 or 250 volts a.c.

The new TB double-break switches are designed to control two isolated circuits. By use of a snap-action spring, almost simultaneous break and make of both contacts is accomplished, in both the normally closed and normally open circuits, it is claimed.

Two screw terminals (one normally open and one normally closed) extend from either end of the phenolic case. The terminals are plated for soldering for applications in which the switch is used without the screws. Two .101-inch diameter holes on a .520-inch center are provided for mounting the switch in a fixed position. These switches will switch 10 amperes at 125 or 250 volts a.c., and 10 amperes at 30 volts d.c. inductive.

Earl R. Brown, 82, Little Chute, Wis., a former Neenah resident and superintendent there of the Bergstrom Paper Co. from 1914-1943, until his retirement 11 years ago, died March 10 after a brief illness.

He was superintendent of a paper mill at Kalamazoo, Mich., before coming to Neenah in 1914.



Welding the Hastelloy alloy F lined segments of the head of one of the digesters for Ketchikan Pulp Company, Ketchikan, Alaska.

Two alloys are SMITHlined in a single digester for both liquor and vapor corrosion problems

will provide protection for Alaska's first pulp mill at Ketchikan

An unparalleled research and testing program which A. O. Smith metallurgical engineers have been and are conducting with the paper industry, now provides reliable corrosion-rate data on alloy digester materials. With corrosive attack differing in the vapor area of the dome of sulphite digesters from that on areas in contact with the liquor, the most satisfactory and economical answer was to provide the alloy most suitable for each corrosive attack.

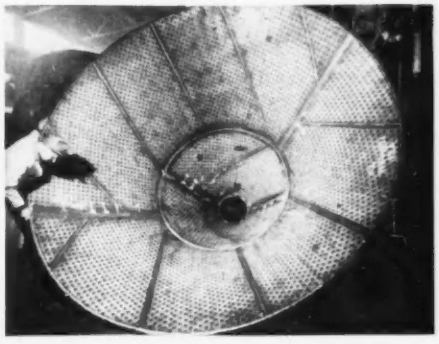
Here the flexibility of the exclusive SMITHlining process excels. With it, two different types of alloy lining are resistance spotwelded to the carbon steel backing of the digester. For example, digesters being fabricated for Ketchikan Pulp Company, Alaska's first pulp mill, will have type 316L (.03% maximum carbon) stainless lining in the area in contact with the liquor, but Hastelloy alloy F* as lining in the vapor area of the dome.

Six 17′ by 58′ digesters for Ketchikan are being fabricated and lined as described. They will produce pulp by the Magnesium Bisulphite (MgO) process. After they have been in service, two periodic inspections by A. O. Smith metallurgists will be made, with mill personnel who will learn how to make future inspections and evaluate conditions correctly. This is a service we render to satisfy ourselves as well as our customers on the performance of digesters we supply.

*Registered trade name of Haynes Stellite Company, a Division of Union Carbide & Carbon Corp.

Inspecting the type 316L (.03% maximum carbon) lining in a shell course of the digester.

Inspecting the type 316L (.03% maximum carbon) lining of the digester cone.



May we assist you on your next vessel problem?

A.O.Smith
CORPORATION

VESSELS • HEAT EXCHANGERS

Milwaukee • Houston

International Division: Milwaukee 1, Wisconsin, U.S.A.

Licensee in Canada: John Inglis Co., Ltd.

PRICES

MARKET WOOD PULP

First Quarter Contract Prices Per Short Air-Dry Ton

	Delivered Basis		Varying Freight Allowances		
	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood		‡$60.00/$95.00*	*$80.00/$85.00*	‖$80.00/ —	
Kraft, Bleached	140.00/147.50	145.00/155.00	$140.00/142.50‖		‖$142.50/ —
Semi-bleached, Kraft	135.00/ —	130.00/135.00	$130.00/132.50‖	130.00/135.00*	
Kraft, Unbl.	95.00/105.00	100.00/135.00	*105.00/110.00*	*105.00/135.00*	
Sulphite, Blchd.	140.00/ —	140.00/ —	$135.00/140.00*	140.00/ — *	$135.00/140.00*‖
Sulphite, Unblchd.	120.00/ —	120.00/ —	$115.00/122.00*	120.00/125.00*	
Sulphite, Unbl. Gl'sn.		124.00/ —	*124.00/ —		
Soda, Blchd.	140.00/ —	140.00/ —			

‡ F.o.b. Shipping Point. ‖ On Dock Atlantic Ports. * Freight allowed.

RAG MARKET

New Domestic Cotton Cuttings

Delivered Mill Basis

	Per 100 lbs.
No. 1 White Shirts	$12.50/$13.00
No. 1 Unblchd. Muslins	14.50/ 15.00
Blchd. & Unblchd. Underwears	15.50/ 16.00
Blchd. Canton Flannels	11.00/ 11.50
No. 1 Light Silesias	7.50/ 8.00
No. 1 Light Prints	6.00/ 6.50
No. 1 Blue Overalls	7.25/ 7.75
Suntan Khakis	6.00/ 6.50
Fancy Shirts	6.50/ 7.00
Mixed Khakis	3.50/ 4.00
Cottonades	3.75/ 4.25
No. 1 Washables	3.50/ 3.75

Old Domestic Cotton Rags

(Prices to Dealers, F.o.b. Ship. Pt.)

	Per 100 lbs.
Mixed White	$2.75/$3.00
Cotton Pants & Overalls	2.00/ 2.25
Thirds and Blues, Repacked	1.65/ 1.75
No. 2 Roofing Rags	nominal

COTTON LINTERS

Memphis Market

F.o.b. Oilmills

		Mar. 16 Per 100 lbs.
Grade 1	n.a.	
2		n.a. / $9.00
3	1st cut—felting	8.50/ 7.00
4		6.50/ 4.50
5		4.25/ 3.25
6	* 2nd cut—chemical	3.00/ 3.00
7		3.00/ 3.00

* Based on 73% cellulose.

Bagging

(Prices to Dealers, F.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny	$4.00/$4.50
Foreign Scrap Burlap	3.00/ 3.75
Heavy Wool Tares	4.00/ 4.25
Austr. Wool Pouches	4.00/ 4.50
Domestic Manila Rope	6.50/ 7.00
Domestic No. 1 Sisal Strings	5.00/ 5.25

WASTE PAPER MARKET

Prices to mills, per ton, f.o.b. cars shipping point (includes brokers' fee.) These quotations are a partial indication of the price range or volume tonnage in each market on the date specified, as gathered from major dealers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal. See TRENDS.

	New York March 22	Boston March 20	Chicago March 10	Phila. March 10
No. 1 Mixed Paper	$10.00/ 11.00	$10.00/ 11.00	$8.00/ —	$9.00/ 11.00
No. 1 News	15.00/ 18.00	15.00/ 17.00	17.00/ —	15.00/ 17.00
Overissue News	18.00/ 22.00	16.00/ 20.00	20.00/ 22.00	21.00/ 23.00
Mill Wrappers	14.00/ 17.00	12.00/ 15.00	11.00/ —	14.00/ 18.00
Old Corrugated Containers	16.00/ 18.00	15.00/ 16.00	20.00/ —	14.00/ 17.00
No. 1 Sorted Br. Kraft Paper	40.00/ 47.50	40.00/ 47.50	45.00/ 47.50	40.00/ 47.50
New Double Kr. Ld. Corr. Cuts	55.00/ 60.00	50.00/ 60.00	60.00/ —	55.00/ 60.00
New 100% Kraft Corr. Cuts	35.00/ 45.00	35.00/ 50.00	25.00/ —	35.00/ 45.00
New Br. Kraft Env. Cuts	70.00/ 77.50	65.00/ 77.50	65.00/ —	65.00/ 75.00
New Br. Kraft Bag Waste	65.00/ 75.00	65.00/ 75.00	70.00/ —	60.00/ 70.00
No. 1 Groundwood Shvs.	20.00/ 25.00	25.00/ 30.00	22.00/ —	20.00/ 27.50
White Newsblanks	60.00/ 65.00	50.00/ 60.00	40.00/ —	60.00/ 65.00
No. 1 Soft Wht. Shvs., coated	65.00/ 70.00	70.00/ 80.00	60.00/ —	60.00/ 70.00
Hd. Wht. Shvs.	102.00/110.00	95.00/110.00	100.00/ —	100.00/115.00
Hd. Wht. Env. Cuts	120.00/130.00	110.00/125.00	105.00/ —	120.00/130.00
Col. Tab. Cards	42.50/ 55.00	55.00/ 60.00	52.50/ 55.00	50.00/ 55.00
Manila Tab. Cards, bales	75.00/ 85.00	80.00/ 85.00	75.00/ —	80.00/ 85.00
No. 1 Col. Ledger	37.50/ 45.00	40.00/ 50.00	47.50/ 50.00	38.00/ 45.00
White Ledger	57.50/ 65.00	60.00/ 65.00	65.00/ —	60.00/ 70.00
Mixed Book & Mag.†	18.00/ 20.00	18.00/ 22.50	15.00/ —	18.00/ —
No. 1 Rep'd. Hvy. Books‡	24.00/ 30.00	25.00/ 35.00	30.00/ —	30.00/ —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% groundwood. § Deld.

PRICES OF MATERIALS

Aluminum sulfate:		
cml. bags, c.l. wks.	cwt.	$1.85 / —
iron-free, c.l. wks.	cwt.	3.55 / —
Casein, acid prec.:		
dom. sh. pt. c.l.	lb.	.26 / .32
Arg. ex dock, duty paid		.20½/ .21
New Zeal. do.		.24 / .25
Caustic soda:		
c.l. wks. solid, 76%	cwt.	3.70 / —
flak. & grd. 400-lb. drums, c.l.		4.10 / —
liquid 50% tanks		2.55
liquid 70% tanks		2.65
China clay:		
dom. air-float, c.l. wks.	ton	10.00
water-washed, lump, filler	ton	11.00
coating	ton	17.60 /30.50
Imported, ex. ship	short ton	16.00 /30.00
Chlorine:		
single-unit tanks, works	cwt.	2.93 / —
multiple unit, 2-5 cars per yr.		3.83 / 5.00
Formaldehyde:		
USP, inh. dms. c.l. wks.	lb.	.0666/ —
l.c.l., E. wks.	lb.	.071 / —
Lime:		
hydrated bags, wks.	tons	14.50 /15.50
Gum rosin:		
K, M, N, drms, c.l. Savan.	cwt.	7.57 / 7.90
Rosin size:		
70%, gum & pale grds., tank cars, south, sh. pt.	cwt.	6.60 / 6.65
Salt cake:		
dom. bulk, c.l. wks.	ton	19.00 / —
Soda ash:		
light, 58%, bags, wks.	cwt.	1.65
bulk	cwt.	1.35
Sodium silicate, 40° Be.:		
tank-cars, wks.	cwt.	1.00 / —
drums, c.l. wks.	cwt.	1.35 / —
42° Be. WW,		
tank-cars, wks.	cwt.	1.60 / —
drums, c.l. wks.	cwt.	1.95 / —
Sodium peroxide:		
dms. c.l. E. of Miss.	lb.	.186
l.c.l. do	lb.	.191 / .201
Soybean, protein:		
chem. isol., wks. c.l. bags	lb.	.25 / .25½
Sulphuric acid:		
60° Be. cbys. c.l. wks.	cwt.	1.75 / 2.00
l.c.l. wks.	cwt.	2.30 / 2.45
tank-cars, wks.	ton	16.30 /18.60
Sulphur:		
crude, c.l. mines, contract,	long ton	25.50 /27.50
f.o.b. vessels Gulf	do.	27.50 /30.50
Sulphur dioxide:		
liquid, coml. cyl., wks.	lb.	.09
multi-unit cars	lb.	.0535
Starches:		
corn, multiwalls, c.l. prod. plant:		
pearl	cwt.	6.39 / —
white, dextrines	cwt.	7.78 / —
chlorinated	cwt.	8.14 / —
potato, Idaho, c.l. wks. W.	cwt.	6.50 / —
East, fr. all. 50 cents cwt.		
potato, Maine, f.o.b. wks.	cwt.	5.75 / —
Talc:		
domestic, sacks, c.l. wks.	ton	25.00 /30.00
Titanium dioxide:		
anatase, c.l. deld. E. bags	lb.	.22½/ .23
l.c.l. deld.	lb.	.23½/ .24
rutile, c.l. deld.	lb.	.24½/ .25
l.c.l. deld.	lb.	.25½/ .26

NEWS OF SUPPLIERS

• LOBDELL UNITED CO. Wilmington, Del. has acquired the engineering, patterns, and tooling and all rights to the manufacture and sale of the Bridgeport and Diamond lines of grinder, and abrasive cut-off machines. These lines were formerly manufactured by the Bridgeport Safety Emery Wheel Co. and the Diamond Machine Co. Bridgeport, Conn. and by the Columbia Division of Lodge & Shipley Co. from whom Lobdell United Co. purchased them on December 31, 1953. Lobdell United Co. is a wholly owned subsidiary of the United Engineering & Foundry Co. of Pittsburgh, Pa.

• AMERICAN WELL WORKS, engineers and manufacturers of Waste Treatment, Water Purification and Pumping Equipment, Aurora, Ill., have appointed S. H. McCullough, 820 Chelsea Avenue, Memphis, Tenn. as Sales Representative for the states of Arkansas, Louisiana and Mississippi, and the western half of Tennessee and Kentucky.

• HANCHETT MANUFACTURING CO., whose main plant is in Big Rapids, Mich. has opened its new West Coast plant and warehouse at 5727 S. W. Macadam Avenue, Portland 1, Ore.

The offices will be staffed with management, sales, and service personnel, each with many years' experience in the manufacture and sale of all types of saw sharpening and knife grinding machinery. The West Coast executive staff is under the direction of H. E. Darling, manager; Walter Noack, plant superintendent, and Hugh Miller, sales engineer.

• HOOKER ELECTROCHEMICAL CO., Niagara Falls, N. Y. has appointed William L. Gillespie, Chicago District Sales Manager and Victor M. Morgan, sales representative with headquarters at the Chicago district sales office.

Mr. Gillespie came to Hooker in 1939. After various positions in operating departments of the plant he was transferred to the sales department in 1950 where he was technical sales field representative. In 1952 he was appointed salesman in the midwest and now replaces Charles Y. Cain who has been promoted to manager, plastics sales.

Mr. Morgan came to Hooker in 1950 as chemical engineer in the process study department. After several engineering positions in the plant he was made a sales production coordinator in the sales department in 1953. He now replaces Mr. Gillespie as a field salesman in the midwest.

read all about it...

Here's a good example that shows how efficiently liquid De-Airex is controlling foam, and at lower cost than other types of defoaming agents.

A midwest newsprint manufacturer made a four-month comparison test. He ran it under normal operating conditions. Performance and cost data compared showed De-Airex with a substantial lead over other de-foamers. On an average production rate of 93 tons daily, De-Airex enabled the manufacturer to cut foam-killer costs from $96 to $36 a day!

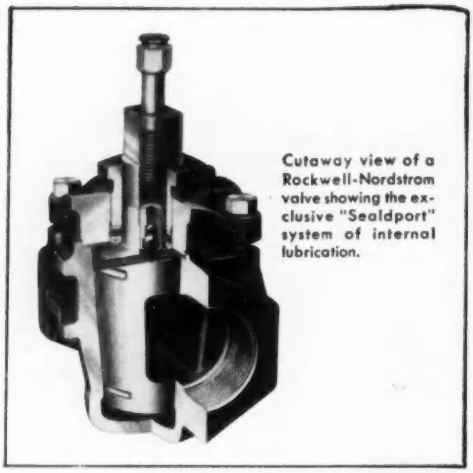
Try De-Airex foam killer. The Houghton Man will gladly arrange a test, make it under your own mill conditions, and complete it without interfering with your production. Call him . . . or write to E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

DE-AIREX FOAM KILLER

. . . a product of

E. F. HOUGHTON & CO.
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .



Cutaway view of a Rockwell-Nordstrom valve showing the exclusive "Sealdport" system of internal lubrication.

Three reasons why *You'll Save Money* with ROCKWELL-Nordstrom VALVES

Your paper mill will save money by installing Rockwell-Nordstrom valves bacause these valves far outlast other types of valves on any paper mill service. Here are three reasons why—

1. **THE SEAT IS NEVER EXPOSED TO THE LINE FLUID**
   This means that corrosive services can be handled without fear of damage to the vital seating surface.
2. **LUBRICANT PROVIDES PROTECTION AGAINST WEAR**
   A thin film of lubricant is distributed between the plug and body preventing the shearing or plowing so common in metal-to-metal closure valves.
3. **WIDE RANGE OF METALS AFFORDS PROTECTION AGAINST CORROSION**
   Rockwell-Nordstrom valves are manufactured in a wide range of corrosion-resistant metals, each designed to handle a certain corrosive service. In this wide selection, there is a type of Rockwell-Nordstrom valve best suited to your needs.

These are only three of the many reasons why Rockwell-Nordstrom valves are the most economical valve for paper mill services. Mail the coupon below today for your free copy of bulletin V-217 describing corrosion-resistant Rockwell-Nordstrom valves. Rockwell Manufacturing Company, Pittsburgh 8, Pa.

Canadian Licensee: Peacock Brothers Limited

ROCKWELL-Nordstrom VALVES

Lubricant-Sealed for Positive Shut-Off

ROCKWELL MANUFACTURING COMPANY 5435-A
Pittsburgh 8, Pa.
Please send me Rockwell-Nordstrom Valve Catalog V-217.
Name_____ Title_____
Company_____
Street_____
City_____ Zone_____ State_____

Harry G. Andersen

John D. Riley

• LINK-BELT CO. has appointed John D. Riley district manager of its Cleveland, Ohio office and Harry G. Andersen district manager of the Newark, N. J., office.

Mr. Riley, who has been district manager at Link-Belt's Newark office for the past five years, succeeds Paul Wheeler, who passed away January 20, 1954.

Mr. Riley joined Link-Belt in 1934 and for five years successively served in various departments of the company's Philadelphia plant. In 1939 he was transferred to the Boston office as district sales engineer and, later, became district manager at Newark.

Mr. Andersen, new district manager at Newark, has been Link-Belt's district manager at Birmingham, Ala., for the past three years. He started with the company in 1937 at the Pershing Road plant in Chicago, where he served in various capacities in the engineering department and Chicago district sales office. In 1948 he was transferred to the Milwaukee office to serve as district sales engineer. He has been at Birmingham since 1951.

• STOWE-WOODWARD, INC., Newton Upper Falls, Mass. has announced plans for building a new rubber roll covering plant at Griffin, Ga. The 16 acre tract was chosen because of its strategic location in relation to Southern paper and textile mills.

The new plant, which will be devoted exclusively to the compounding and application of rubber roll coverings, will be complete with the most modern equipment, and will furnish special Stowe-Woodward coverings for rolls up to 70" in diameter and 310" in length.

• FOSTER D. SNELL, INC., New York firm of Consulting Chemists and Publishers of "Chemical Market Abstracts," announces the return of Marshall N. Levin to the New York office at Editor of "Chemical Market Abstracts."

Mr. Levin joined the staff of *CMA* in 1950 soon after it started publication as "The Chemical Market Report" and has been in Europe for the past two years as European Correspondent for the journal. He spent considerable time in Paris, where he was connected with the Centre Scandinavia. Mr. Levin did graduate work at the University of Chicago and at the Sorbonne before joining the staff of Foster D. Snell, Inc.

Attapulgus and Edgar Brothers Plan Merger

Wright W. Gary, president of Attapulgus Minerals & Chemicals Corp., and James Deshler, president of Edgar Brothers Company, have announced that a basis of merger of the two companies had been agreed upon, subject to ratification by directors and stockholders.

Attapulgus is the largest producer in this country of fullers earth used widely in the chemical, petroleum and other industries. Mines and processing plant are located in Georgia. It also owns important patented processes for the concentration of mineral ores, particularly phosphate and potash, which it licenses to others. Research laboratories are maintained at Lakeland, Fla.; and Camden, N. J.

Edgar Brothers is the oldest and one of the largest integrated producers of kaolin, a basic raw material used in the production of high-grade papers, wallpapers and paperboard. Edgar aluminum silicate pigments are being used in increasing quantities in paints, adhesives, printing inks, plastics and other important industrial specialties. The company owns extensive kaolin deposits, operates two mines, five processing plants, and research laboratories in Georgia.

The name of the merged company is to be American Minerals & Chemicals Corp.

The Attapulgus and Edgar Brothers businesses will retain their identities and will be operated as separate divisions of American Minerals & Chemicals Corp. By combining the research activities of the two organizations it is believed that new mineral and chemical products, not now produced by either Attapulgus or Edgar Brothers, can be developed and marketed.

ONLY NASH VACUUM PUMPS HAVE ALL THESE FEATURES
One Moving Element. Non-pulsating Vacuum. No Internal Parts In Wearing Contact. No Internal Lubrication. Handles Liquid With Air. No Expert Attendance. Constant Efficiency. Low Maintenance Cost.
Plus-
NASH ENGINEERING COMPANY
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NEWS OF ASSOCIATIONS

Consultant Service Featured at Packaging Exposition

Visitors to the Packaging Exposition will be able to discuss their problems with one of the most experienced technical men in the field, Philip S. Barnhart. His services will be provided without charge by the Glassine & Greaseproof Manufacturers Assn.

Mr. Barnhart has spent twenty-two years in the development of glassine and greaseproof papers, as well as lacquer-coated, laminated and waxed specialties. Most of his work has been in food packaging, cooperating with converters and food packers, and dates back to the introduction of water vapor permeability testing and package testers.

Mr. Barnhart will be in attendance April 5-8 inclusive at the booth of the Glassine & Greaseproof Manufacturers Assn. at the Packaging Exposition in Atlantic City.

Paper Plate Assn. Elects Officers

Paper Plate Assn., Inc., on March 10 at the Hotel Lexington in New York City, elected the following officers:

Alfred Bleyer, Alfred Bleyer & Co., was chosen as the new chairman, and Tom Ecclesine of Fonda Container Co. was elected vice-chairman. Ben Vail was re-elected secretary-treasurer.

Superintendents Meeting Dates

DATE	DIVISION	PLACE
Apr. 20	Miami Valley Div.	American Legion Hall, Middletown, Ohio
May 6-7	Northwestern Div.	Leamington Hotel, Minneapolis, Minn.
May 14-15	Penjerdel, Spring Meeting	Yorktowne Hotel, York, Pa.
May 20-21	Pacific Coast Joint TAPPI	Gearhart Hotel Gearhart, Ore.
June 21-23	National	Sheraton-Mount Royal Hotel Montreal, Que.
Sept. 23-25	Northeastern Div.	Poland Spring House Poland Spring, Maine

TAPPI Meeting Dates

DATE	SECTION	PLACE
Apr. 1	Kalamazoo Valley Section	Hotel Harris, Kalamazoo, Mich.
April 2	Central District Empire State	University Club, 431 E. Fayette St., Syracuse, N.Y.
Apr. 3	Northern District Empire State	
Apr. 8	Ohio	Plant Tour-National Starch, Indianapolis, Ind.
Apr. 13	Lake States	Forest Products Laboratory, Madison, Wis.
Apr. 13	Metropolitan District Empire State	Fraunces Tavern Pearl & Broad Sts. New York City
Apr. 14	Western District Empire State	Washington Rm., Park Hotel, Lockport, N. Y.
Apr. 16	Lake Erie	Carter Hotel, Cleveland, Ohio
Apr. 19	Chicago	Chicago Bar Assn. Chicago, Ill.
Apr. 22	Delaware Valley	Engineers Club 1317 Spruce Street, Philadelphia, Pa.
Apr. 22	Eastern District Empire State	Milfranks Restaurant Glens Falls, N. Y.
May 14-15	Southeastern	Hotel De Soto, Savannah, Ga.

CHAS. T. MAIN, INC.
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Process Studies, Design, Specifications and Engineering Supervision
PULP AND PAPER MILLS
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Reports, Consultation and Valuations
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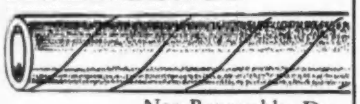

Non-Returnable, Durable standard mill core.

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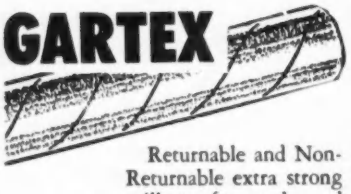

Returnable and Non-Returnable extra strong mill core for regular and special needs.

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J. E. FRICKE CO.

Members of the board of directors were chosen as follows: Paul Willen, Superior Paper Products; Tom Ecclesine, Fonda Container Co.; E. H. Wolfberg, St. Joe-Mullen Container Corp.; Mrs. Ann Ruckert, Kleen Products; and Wm. McNitt, Continental Can Co.

Thoma Addresses Mich. Meeting

Paul J. Thoma, associate director, Springdale Laboratories, Time, Inc., Springdale, Conn., on March 4, addressed a dinner meeting of Kalamazoo area papermakers at Hotel Harris, Kalamazoo. The meeting was sponsored by the Kalamazoo Valley Section of TAPPI. Members of the Michigan Division of the Superintendents Association were present at the meeting as guests.

Reginald Hurst, Kalamazoo Vegetable Parchment Co., was chairman of the meeting. Mr. Thoma was introduced by Arthur Dean, Michigan Paper Co. Robert T. Elias, Western Michigan College, Harrison Kindig, Mac Sim Bar Paper Co., and Marshall Rutz, Kalamazoo Vegetable Parchment Co., also were at the speaker's table.

SMILES AT OHIO TAPPI MEETING — McGraw Hill editor S. D. Kirkpatrick (center) spoke with wit and wisdom on the dynamic growth of the chemical industry at the March 9th meeting of Ohio TAPPI. John L. Clouse (left), Oxford-Miami Paper Co. and chairman of the Section, joins National Secretary McDonald in a broad smile. Mr. Clouse reported at the Middletown dinner meeting that fifteen new members have joined the Section.

AMERICAN PAPER AND PULP ASSOCIATION'S PAPER PRODUCTION RATIO REPORT

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Feb. 13	Feb. 20	Feb. 27	Mar. 6	Mar. 13
1954	95.1	94.6	94.7	94.0r	94.2
	Feb. 14	Feb. 21	Feb. 28	Mar. 7	Mar. 14
1953	94.9	94.4	94.6	93.2	95.1

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1953	94.5	94.6	94.4	92.7	93.9	93.8	82.2	94.7	92.7	97.2	94.6	82.3	92.3
1954	94.2‡	94.5‡											

COMPARATIVE YEARLY SUMMARIES

	1947	1948	1949	1950	1951	1952	1953	1954
Year to Date	104.9	100.7	93.1	94.7	100.9	97.6	94.9	94.3
Year Average	101.7	92.1	83.7	95.8	98.0	88.6	92.3	

‡ Preliminary.
r Revised.

PAPERBOARD OPERATING RATIOS†

	Feb. 13	Feb. 20	Feb. 27	Mar. 6	Mar. 13
1954	91	89	88	88	91
	Feb. 14	Feb. 21	Feb. 28	Mar. 7	Mar. 14
1953	95	94	95	96	94

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1953	91	95	95	95	96	93	81	98	94	97	94	79	93
1954	89	89											

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

Note: In the above tables *all* the ratios shown are on the basis of a normal 6 and 7 day capacity.

† Per cents of operation based on "Inch-Hours" reported on a 6-day basis to the National Paperboard Association.

HOW TO PRODUCE A MORE UNIFORM SHEET AT LESS COST

If you are to maintain and improve sales and profits you must continually strive to improve your product and at the same time cut costs.

The Poirier Master Syphon System does just that. It scrutinizes every inch of the sheet passing over the suction boxes, automatically compensating for variation in slowness, freeness, etc. as they occur—it guarantees that the sheet contains the proper amount of water at the dandy and following operations.

The Poirier Master Syphon System means a more uniform sheet and increased production. Besides this, costs are cut by savings in power, by eliminating the expensive large suction pumps; and friction is reduced over the suction boxes. Among the many other advantages is added life for wires and suction box covers.

The Poirier Master Syphon System is automatically controlled. A vacuum control valve and a water control valve initiate the action of the system and function in accordance with the porosity of the sheet. This, in turn, makes possible constant and correct moisture content in the sheet as it leaves the wire and at the dandy. It also assures the proper amount of air coming through the sheet at the dry boxes.

This system is not complicated, in fact, there is only one moving part, which means a minimum of upkeep.

Because of its many benefits, the Poirier Master Syphon System is used by leading concerns throughout the pulp and paper industry. It will help you, too.

Without obligation on your part, let one of our engineers study your operation and then show you how a Poirier Master Syphon System will help you produce a better paper at lower cost.

Write for full information today.

POIRIER CONTROL COMPANY
Waterville 1, Maine
Specialists in Stock Control Equipment

PAPER TRADE JOURNAL CLEARING HOUSE PAPER TRADE JOURNAL

RATES FOR ADVERTISING (PAYABLE IN ADVANCE) — $.75 cents per line (6 words to line) minimum charge $3.75 —Additional charge of 70 cents if box number is used

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Space in this section can also be purchased at $5.00 per column inch—(1" x 2¼)

Address replies to advertisements appearing under Box Number in care of
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HELP WANTED

POSITIONS OPEN

We can place—Supt. rag content paper mill; mgr. southern kraft pulp and kraft paper mill; 2 supts. for Cyl. mach. board mills; several asst. supts. and tour bosses; 2 technical directors; supt. finishing and shipping large mill on fine papers, attractive salary.

Envelope plant mgr., supts., foremen and machine adjustors; chemists and chem. engineers for mills and for demonstrating and selling; power plant supervisors (2); design engineer, executive, excellent salary; salesmen, (several).

If you are available for a position in paper or pulp mfg. or paper converting, SEND US YOUR RESUME. It will be in confidence. No charge unless you accept employment through our Service.

CHARLES P. RAYMOND SERVICE, Inc.
Phone: Liberty 2-6547
294 Washington St., Boston 8, Mass. M-26

TOUR BOSS
BOSS MACHINE TENDER

For eastern mill on groundwood printing grades; fourdrinier machines only. Excellent opportunity, salary, working conditions. Reply should include all qualifications and experience. Box 54-111, care Paper Trade Journal. A-9

WANTED

Master Mechanic to take complete charge of maintenance of one machine Midwest chipboard mill. State age, experience and salary expected. Reply will be held confidential. Reply Box 54-109 care Paper Trade Journal.
M-26

WORKING FOREMAN to take charge of Printing Department in Envelope Plant. Should be experienced in running Harris P 2 Presses and familiar with rubber plate making. Give full details of experience and qualifications. Plant located in New York State outside of Metropolitan area. Address Box 54-123 care Paper Trade Journal. M-26

ASSISTANT
SULPHITE MILL SUPERINTENDENT

Large eastern pulp and paper manufacturer seeks an Assistant Sulphite Mill Superintendent. A college degree and operating experience are desirable. Applicants should be between 30 and 40 years of age. Salary will be commensurate with experience and background. Reply to: Paper Trade Journal, Box Number 54-98. M-26

WANTED

Thoroughly qualified and experienced executive to have overall supervision as Finishing and Shipping Superintendent over all Cutting, Supering, Rewinding, Embossing, Finishing, Warehousing and Shipping in large Writing Paper Mill in Middle Atlantic States. Address Box 54-113 care Paper Trade Journal.
A-9

HELP WANTED

TECHNICAL DIRECTOR

Excellent opportunity for Technical Director in a progressive pulp and paper mill located in the Middle Atlantic States.

Prefer Ph.D. or M.S. in Chemistry or Chemical Engineering. Candidates must be at least 35 years of age, possess administrative potentialities and have industrial experience in the field of pulp, paper, coatings, quality control and other related problems.

Remuneration will be commensurate with qualifications. Liberal company benefits. Replies held in strictest confidence. Address Box 54-99 care Paper Trade Journal. M-26

CHEMIST OR CHEMICAL ENGINEER

Opportunity available for Chemist or Chemical Engineer in an expanding pulp and paper mill located in the Middle Atlantic States. Age 25-35 years with several years experience in pulp and paper chemicals and fibers. Good salary with excellent opportunity for advancement. Send resume of educational background and industrial experience. All replies confidential. Address Box 54-100 care Paper Trade
M-26

GRADUATE MECHANICAL OR INDUSTRIAL ENGINEER

For top supervisory position, located upper mid-west, 2 machine groundwood paper specialty mill, national organization, age 28-38, write giving complete details educational and experience, box #54-83 care Paper Trade Journal. TF

TECHNICAL DIRECTOR
For new and expanding pulp mill

Chemical engineering graduate with at least ten years' experience in the manufacture of bleached kraft pulp and high grade white papers. Must have had enough experience in directing technical work in these fields to qualify him to assume full responsibility for the management of Technical Department. This would include the supervision of laboratory, quality and process control, process and product development.

All replies will be kept in strict confidence. Please make your resume as complete as possible and furnish recent photograph. Our employees know about this advertisement.

Address Box 54-94 care Paper Trade Journal. A-9

SALESMAN WANTED to sell clothing to paper mills in the south on salary and commission. Unusual opportunity with old established firm. Present staff knows of this opening. Address Box 54-15, care Paper Trade Journal.
TF

LARGE, well known company, prominent supplier to the paper industry, desires salesman for important Midwestern territory. Good paper and chemical background essential. Address Box 54-121 care Paper Trade Journal. M-26

Help Wanted and Situations Wanted Advertisements continued on page 53

FOR SALE

CAMERON SLITTERS
1—84" Type 10-A.
2—72" Type 10-11, Shear-cut.
1—72" and 1—26" Type 10-10.
1—72" Type 8-10.
1—62" Type 9-5.
1—62" Type 40-1-AF.
1—42", 1—52", 62" and 2—72" Type 10-5.
1—42" and 1—52" Type 6.

OTHER SLITTERS
1—102" Langston Mill Type Shear Cut. 46" Rewind.
1—90" Johnstone Mill Type Score Cut. 44" Maximum Rewind.
1—40" and 1—60" Langston Type A Shear-cut and 1—40" and 1—50" Duplex.
1—56" Chambon, Shear-cut.
1—48" Kidder Model CH Shear-cut.
1—48" Inman Shear-cut, 48" dia. Rewind.
1—40" Kidder Model SL Shear-cut.
1—30" Meisel Shear-cut Series OP.
1—30" and 50" Model B Fales Slitter.

POWER PAPER CUTTERS
14—Seybolds, 34" 3Y, 1—50" Precision, 40" & 56" 10Z, 44", 54" and 84" 20th Century, 44", 56" and 64" Daytons, 34", 44" 48" and 64" Holyokes.
6—Oswegos, 32", 36", 38", 68", 74" & 84".

PRINTING PRESSES
1—36" 6-Color Precise Engineering Co's Rotogravure Press.
1—26" Champion 5-Color Rotogravure.
1—14" 3-Color Hy-Rote Rotogravure.
1—36" 2-Color Manhassett. Roll to Roll with Slitting Attachment.
1—Milk Bottle Cap Machine with 2-Color Printer.
1—Business Form Equipment. Consisting of 12" x 18" New Era Press; 13" x 28" Carbon Processor and 12" x 17" 7-Part Collator.

MISCELLANEOUS MACHINES
1—28" x 41 John Thomson, Style 2, Cutter & Creaser with 7 Chases and A.C. Motor.
1—36" Hot Melt Coating Machine.
1—60" Golden Gate Varnishing Machine with complete motor equipment.
1—60" Hudson Sharp Household Wax Roll Machine.
2—Die Presses, 1—#34-46" x 33" Sheridan Heavy Duty, 1—Seybold 38" x 24".
7—Embossers, 1—32", 1—42", 3—60", 1—72" and 1—81".
2—Sheridan Continuous Feed Embossers. Models 8D and 10A.
2—81" Dietz Toilet Paper Converters.
1—58" Paper Converting Machine Co's Single-Fold Towel Machine.
1—Weber Model 2CN Satchel Bottom Cellophane Bag Machine.
1—Bagprint #18 Bag Machine.
2—Hanzel F. & S. Bag Machines. Same Range as 8-10 Bagprint.
1—36" and 1—45" Beck Rotary Sheeters, with electric eye. 45" and 55" without elec. eye.
1—G.E. Electric Eye for Beck Sheeter.
1—66", 1—84" and 1—100" Hamblet Single Rotary Sheeters with Backstands and Layboy. 1—30" & 1—72" plain.
1—72" Moore and White Sheeter, Backstands and Layboy.
3—Schultz Automatic Rewinders. 1—18", 1—24" and 1—48". 18" for Foil or Paper.
1—Hudson-Sharp Facial Tissue Folder for Boxed Tissue.
1—72" Black-Clawson Creping Machine with Reeves Drive.
1—60" Mills Machine Co. Creping Machine.
2—Paper Drinking & 3—Paper Fluted Cup Converting Machines. Foreign only.

PAPER AND PULP MILL MACHINERY
1—112" Knife Clark-Aiken Sheeter with Erie Layboy, Mamco Counter and 2-Roll Backstands.
1—#4, 1—#8 & 1—#9 Nash Hytor Vacuum Pumps.
1—1200# Iron Tub Beater.
2—14" Daniels Rag Cutters with Railroad Duster.
2—Nekoosa Portable Pulp Wood Peelers, Gasoline Powered.
1—7-Roll 54" Holyoke Stack of Super Calenders with AC Motor Equipment.
1—52" 3-Roll Stack of Calenders.
1—38" 5-Roll Sheet Fed Stack of Super Calenders.
2—Model 8' and 1—Model 9' Wandel Dynopulper.
1—Valley Iron Works Voith Kneader.
2—APMEW C. S. Screens.
5—Jordans, 3—Noble & Wood Mastodon, 1—Mamouth and 1—E. D. Jones Imperial.
4—36" Dilts-Cowles #4 Horizontal Classifiners.

GIBBS-BROWER CO., INC.
Please address reply to Room 902
21 E. 40th Street, New York 16, N. Y.
Telephone Murray Hill 5-7824 M-26

ROSS PAPER MACHINERY COMPANY

CABLE ADDRESS
JACKROSS

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BUY WITH CONFIDENCE — RPM SINCE 1919 — SELL WITH CONFIDENCE

USED PAPER MAKING & CONVERTING MACHINERY

Humboldt 2-2177

AGITATOR DRIVES
2—Cleveland enclosed—3 h.p. Ratio 24 to 1.
1—Foote Bros. enclosed—15 h.p. Ratio 33 to 1.

BALERS
1—Economy Baler—60 x 32 x 96, with motor.

CALENDER ROLLS
46—Chilled Iron Rolls—Assorted sizes.

CALENDER STACKS
1—Black Clawson 90" 7 roll with 2 spare rolls.
1—Pusey & Jones 88"—7 roll Ryertex Bearings, 2 roll board.
1—Lobdell 96" 10 roll, with water cooled bearings, doctor and drive.

CYLINDER MOLDS
1—77" face x 48" dia.—Stainless Steel Shaft.
2—102" face x 36" diameter, with 18" diameter rubber couches.

DAMPENER
1—Valley Micromist Unit for water finish on paper—120" deckle.

DRIVES
1—#3 Reeves anti-friction bearing.
1—Cleveland enclosed drive right angle, 7 h.p.
1—#6 Reeves vertical, ball bearing.
1—Lewellyn, 20 h.p., totally enclosed. Vertical class C-6-1. New.
1—U. S. Varied Drive Synchronous Gear Motor, 3 h.p., Ratio 2 to 1. Gear Ratio 1.82-1.
1—Reeves #3G, Horizontal. Enclosed drive.
2—Farrel Birmingham Herringbone Gear Reducers 10 h.p., 825-38.19 r.p.m.

DRYERS
2—160" face x 36" diameter.
1—139" face x 48" diameter.
16—127" face x 42" diameter.
1—126" face x 48" diameter.
1—124" face x 48" diameter.
1—116" face x 48" diameter.
1—116" face x 36" diameter, with gears and bearings.
1—116" face x 24" diameter Lead Dryer.
1—110" face x 42" diameter, with bearings.
1—104" face x 36" diameter.
1—103" face x 48" diameter.
1—102" face x 48" diameter, with bearings.
50—100" face x 48" diameter, complete with gears, 2 deck frames, bearings and steam joints.
10—88" face x 48" diameter, with frames, gears, bearings and felt roll.
3—88" face x 36" diameter, with frames, gears and bearings.
1—86" face x 36" diameter, with frames, gears and bearings.
60—74" face x 36" diameter, with gears and bearings.
26—46" face x 48" diameter, with gears, bearings and steam joints.
8—42" face x 36" diameter, with frames, gears and bearings.

DYNAPULPER
1—Rice Barton 9 ft. Dynapulper, with 54" diameter impellers. Requires 50 HP motor.

FILTERS
1—Oliver Vacuum Filter, 10' face x 5' 3" diameter, Steel vat.

FLAT SCREENS
3—8 plate Sandy Hill Roller Shoe.
2—Bagley & Sewall 8 plate.
2—16 plate Sandy Hill Roller Shoe with scrapers.

GRINDER
1—Roberts Model 100 Grinder. Complete with stone. New 1947. Used two months.

HYDRAULIC PRESS
1—Thropp 200 ton. Steam platens, 40" x 40" with pump.

JORDANS
2—E. D. Jones Pony, 3/16" stainless steel fillings—banded plugs, spare new fillings.
1—Smith & Winchester Standard with granite fillings.
1—#2 Miami anti friction bearing 200 h.p. synchronous motor with controls.
1—#6 Miami, for motor drive.

KAMYR WET END
1—Kamyr Continuous Feltless Wet End. Cylinder 59" diameter x 80" face. Steel vat—rubber couches—spare rolls and spare parts.

KNIFE GRINDERS
1—100" Hanchett Knife Grinder with motor.
1—130" Hanchett, complete with Coolant pump, 2 spare wheels and motor.
1—92" Seybold Knife Grinder.
1—Koegel Slitter Knife Grinder.

MOTORS
12—125 h.p. Westinghouse Synchronous enclosed. Brand new. 440 volt, 720 r.p.m. Forced air ventilation.

PARRY LINER
1—Parry 52" Liner, complete with motor.

PRESS SECTION
3—Complete Sections. Rolls 102" face x 16" and 18" diameter. Rubber and iron, with drives.

PULP EQUIPMENT
1—APMEW Ball Bearing Pulp Screens—30 ton capacity—outward flow.
2—Valley Voith Screw Press, size 2A.
1—Tyler Chip Screen #600, single deck.

PUMPS
44—Centrifugal Pumps, open & closed impellers. Direct connected or Belt Driven.

REELS
1—Pusey & Jones 162" drum reel, complete with unwind stand and water cooled brake.
1—Downingtown 104" 2 bowl Reel, complete with drive and adjusting devices.

ROLL GRINDER
1—Lobdell 18' Roll Grinder handles 26" maximum diameter rolls.

ROLLS—PRESS, COUCH, etc.
32—Press rolls, brass and rubber covered.
14—Couch rolls, brass and rubber covered.
250—Brass and steel carrying rolls.

ROTARY DIGESTER
1—New Biggs 12½ ft. Rotary with drive—100# pressure.

ROTARY SCREENS
2—#2 Bird—Copper vat.
1—#2A Bird with copper vats.

SAVEALLS
1—Bird #5 with enclosed drive and 3 h.p. motor.
2—Bird #6A, complete, including motors. Anti friction bearings throughout.

SHEETERS
1—Hamblet 124" Duplex Sheeter with Maxson layboy—8 roll backstand—motor and starter.
1—Moore & White Simplex 114" Sheeter with slitters—counter. Maxson layboy overlapping delivery. 8 roll backstand, motor and starter.
1—Clark 68" single knife, with layboy, 12 roll backstand & motor.
1—Cameron 124" quick change double slitter assembly for board sheeter. Complete with 16 pneumatic slitters.
1—Hamblet 100" single knife with 3 slitters. Very heavy duty.

SLICE
1—Beloit 132" adjustable slice, complete, including stands. Slice is of all bronze construction. Operated 1000 feet per minute.

SLITTERS AND WINDERS
1—Johnstone 130", anti friction bearing equipped 50" rewind. 1800 ft. per minute.
2—Langston 112" anti friction bearings, complete with 20 h.p. motor and controls. 52" rewind. 1250 ft. per minute.
1—Cameron 72"—Model 10-5. 29" maximum rewind.
1—Cameron 42"—Model 6—24" rewind.
1—Cameron 32"—Model 26-3A. Duplex rewind.
1—Ruf 60" razor blade slitter with motor.

STEAM TURBINE
1—Terry Steam Turbine 125 h.p.—160 h.p. 50 lb. back pressure, complete with enclosed drive and Link Belt Silent Chain Drive.

STOCK PUMPS
1—Shartle 10 x 20 Single Plunger Pump.
1—Beloit 8 x 10 Triplex.
2—Shartle Agi-flo Anti-friction bearings.
1—Moore & White 10 x 16 Triplex.
1—Moore & White 8 x 8 Triplex.
1—Shartle 8 x 18 Duplex.
4—Beloit open impeller Pumps, 5000 g.p.m. at 35' head. Anti friction bearings.

SUCTION COUCH ROLLS
1—Millspaugh 36" diameter x 234" drilled face with enclosed drive, water cooled bearings 12" suction boxes.
1—Millspaugh 156" drilled face x 22" diameter Suction Couch. Operated at 1000 ft per minute.
1—Sandusky Suction Couch, 25" diameter x 122" drilled face.
1—Sandusky 30" diameter x 210" drilled face, roller bearing equipped, complete with new pinion gear.

SUCTION FELT ROLL
1—New Downingtown 186" drilled face x 16" diameter, with anti friction bearings and stands.

THICKENERS
1—IMPCO 5 ft. diameter Vacuum Thickener. 80" face with steel vat and spare couches. Used 3 years.
1—Hewitt 42" diameter x 88" face cylinder 16" diameter rubber couch—all anti friction bearings. Steel vat, 2 years old.

TOILET TISSUE PERFORATOR
1—Paper Converting Machine Co. Model 141, automatic 81" Perforator, ball bearing.

TRIMMERS
1—Seybold 74"—Model 12 ZG.
1—Seybold Dayton 74", with motor.
1—Seybold Dayton 64", with motor.
1—Seybold 64"—20th Century—Power back gauge.
1—Seybold 48" Dayton—Power back gauge.
1—Seybold 45"—20th Century—Power back gauge.
1—Seybold 38" Trimmer—power back gauge.
1—Seybold 64" Model 102, with motor.

VACUUM PUMPS
1—Nash L-6
1—Nash #6 Hytor.
1—Nash ½ H-5 Vacuum Pumps.
3—Nash L-3, with totally enclosed 5 h.p. motor.
1—Nash #2 Hytor, with totally enclosed 7½ h.p. motor.
1—Connersville 2.1 cu.ft. per rev. With base.
2—Connersville 1.65 cu.ft. per rev. With base
1—Connersville .75 cu.ft. per rev With base.
1—Connersville Type RSB. With base.
1—Nash H-4.

VOITH INLETS
2—Valley Iron Voith Inlets, adjustable 83" to 86"—brass lip, stainless steel apron.
1—Valley Iron Voith Inlet 156" with motor drive, brass construction. Operated at 1000 ft per minute.

VORTRAPS
2—4" Stainless Steel with rubber lined heads.
1—New 8" with fittings and receiver.
2—3" stainless steel, with valves.
1—1½" stainless steel, with valves.
2—Stainless Steel Vortrap Capacity Tanks.

WET MACHINES
1—Rogers 96" double press Wet Machine, 48" diameter cylinder—rubber couch, spare new top and bottom felts.

FOR SALE

1 No. 18 Camachine, drum face 110". Represented to be in very fine condition.
1 148" Langston rewinder without unwind, speed 2100 FPM.

1 Yankee dryer 12 ft. dia. x 120" face. With bearings and now insured for fifty lbs. pressure. Can be seen in operation.

1 Yankee dryer 10 ft. dia. and 132" face with bearings and Link Belt drive except chain. Insured for thirty-five lbs. pressure.

1 126" trim paper machine with Fourdrinier, two sets of presses, 20" dia. rolls. One smoothing press. 40 Dryers 48 x 130". 8 roll calender, bottom 24", reel and winder, drive. Low price for quick sale.

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175 Richdale Avenue **Cambridge, Massachusetts**

A-2

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M-26

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FOR ROOFING AND FINE WRITING PAPER MILLS

Capacities
from one to five tons an hour

TAYLOR-STILES and Company
CUTTING MACHINES & KNIVES

10 Bridge Street, Riegelsville, New Jersey

FOR SALE

AGITATOR DRIVES
One Foote enclosed vertical drive, triple reduction, type 6.99-150 A T, ratio 319.4 to 1 with direct connected 15 HP, totally enclosed, 1800 RPM, 440 V, G.E. motor.
Two Foote enclosed vertical, type 10, HGV (2) with 15 HP, 600 RPM, 440 V motor with V belt drive (stainless steel agitator for tower, 9 ft. dia. x 25 ft. high.
One Falk enclosed type 9 D X 2, ration 11.4 to 1, 100 HP but no motor available.

BAG MACHINES
Five A G Wehner for 5-16 lb. bags. New 1948.

BALING PRESSES
Economy down stroke, 36" x 20" x 50" with 3 HP, 220-440 V, 16 RPM motor. New 1951. Used test run only.
New 1951. Used test run only.
One Economy hand-operated baling press, about 50 lb.

BARKERS
Green Bay barker with knife grinder and barking press.
Two 60" Waterville iron works disc barkers.

BEATERS
One 56 x 48" Dilts bandless beater, cast iron tub. V belt drive.
Three 48 x 48" Noble & Wood with cast iron tub.
Four 62 x 60" Dilts high speed bandless with cast iron tub.
Two 65 x 57" Jones, bronze bars.
One 60" Shartle breaker beater with cast iron tub.

CALENDERS
1—6-roll, 62" Pusey & Jones box frame.
1—8 roll, 62" Pusey & Jones box frame.
1—6-roll, 80" Pusey & Jones.
1—9-roll, 84".
1—96", five-roll box frame, all water cooled bearings, Farrel.
1—7-roll, Rice Barton, 86"
1—5-roll, 100" stack with 3—16", 1—15" and 1—12" roll.
1—9-roll, 114" Sandy Hill, 22" bottom.
1—8-roll, 124" Lobdell with 24" bottom roll.
1—8-roll, 130" Horne calender, bottom 24", 2—18", 5—11", all water cooled bearings.
2—7-roll, 138" Beloit, 26" bottom, 2—16", 4—13".

SUPERCALENDERS
1—7-roll, 58".
1—10-roll, 64".
1—7-roll, 74".
1—10-roll, 72".
1—9-roll, 86", anti-friction, bottom 24", top 21", 17" cotton.

CHIPPERS
One 2-knife Appleton, 24".
One 3-knife, 84".
Two 4-knife, 84".
One 4-knife, 96".
Two 6-knife, 96".
One 10-knife, 84" Carthage.

COATING MACHINES
Two 42" coating heads with rolls 14 x 42".
One 80" Waldron air knife coater, about 12 years old.

CONVERTING EQUIPMENT
Single fold Dietz twin type fuwe interfolder, 81".
One Cannard Company semi-automatic toilet roll wrapping machine.
One Cannard Company Junior automatic toilet roll wrapping machine.
One Hudson Sharpe, three web, quarter fold napkin machine.

CUTTERS (Sheet)
1—44" Finlay spider type knife bar.
1—58" Finlay heavy cast iron knife bar.
1—72" Clark.
1—74" Dillon duplex, duplex slitter attachment.
1—72" Hamblet and layboy.
1—74" Moore & White with layboy, rebuilt.
1—84" Dillon with Brannon folder, rebuilt.
1—90" Hamblet duplex.
1—100" Dillon duplex.
1—108" Moore & White with Moore & White layboy.
1—128" Horne duplex.
1—156" Hamblet duplex with slitter attachment.
Also 1—124" Hamblet heavy duty duplex with Cameron rotary board slitter.

CYLINDER MOULDS
1—36 x 48" with anti-friction bearings.
1—36 x 86".
5—36 x 88".
3—42 x 83".
7—36 x 100".
5—36 x 102".
5—36 x 125".
2—48 x 92".
1—60 x 84".

DIGESTERS
One stainless steel 36 x 36, 100 lb. pressure with bearings, gear and pinion.
Three 9 ft. x 17 ft. long Blaw-Knox rotary Philadelphia reducers, ratio 80 to 1 and 40 HP, 440 V motors. Used six months.

DRIVES
Three H I PIV used three months.
Six H 3 PIV, new 1949.
Two H G 3 PIV, 2 to 1 speed.
Two V M 3 with 5 HP, ratio 2 to 1.
Two V M 3, ratio 2 to 1 with 5 HP, 1800 RPM, 540 V motor.
H 4 PIV with 7½ HP, 220/440 V motor, ratio 6 to 1, used three months.
Two 00 Reeves drives, enclosed horizontal.
One Welland drive Number 15, open horizontal, Class D, ratio 5 to 1.
No. 5 Reeves, open horizontal, ratio 3 to 1.
15 HP Reeves transmission, ratio 3.93 to 1 with 15 HP, 440 V, totally enclosed fan cooled motor, new 1949.

DRYERS
9—24 x 48" chrome plated.
42—48 x 48" chrome plated with bearings.
6—36 x 62" Pusey & Jones
11—48 x 74" Pusey & Jones.
11—48 x 74".
21—36 x about 80".
21—36 x 96" Sandy Hill.
3—36 x 85" Beloit.
20—48 x 129".
20—48 x 131" with two 36" felt dryers.
24—48 x 134" Beloit.
40—48 x 160" Pusey & Jones with bearings and sheaves.
72—42 x 118" Beloit, gears bearings and vertical frames.
38—36 and 40" dia. x 84", arranged four high vertically, with frames, gears, bearings.
1—12 ft. x 129" Yankee with bearings.
1—12 ft. x 140" Beloit Yankee.

EXTRACTOR ROLL
12 x 179" with anti-friction bearings (plain).
24 x 132" (plain).
24 x 134" (plain).
Suction 22" x 134" Downingtown with bearings (anti-friction) and housing.

FILTERS
2 ft. x 3 ft. Oliver experimental.
6 ft. x 4 ft. Oliver with cast iron tank.
2—8 ft. x 4 ft. with stainless steel heads and wire.
5 ft. x 8 ft. Impco.
6 ft. x 8 ft. Impco.
8 ft. x 8 ft. Oliver two-drum, 1947, with type 304 stainless steel.

FOURDRINIERS
80" with 50 ft. wire, Moore & White.
82" with 45 ft. wire.
100" with 50 ft. wire, Pusey & Jones
116" with 50 ft. wire, Beloit.
149" x 65 ft. wire, Rice Barton, 22" suction couch with new shell, last operated 600 ft.
156" x 70 ft. Rice Barton.
166" Pusey & Jones, 65 ft. wire.

GRINDERS
Farrel, takes roll 24" x 160".

FRANK H. DAVIS COMPANY

175 Richdale Avenue **Cambridge, Massachusetts** TF

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WANTED—Top grade Converting Superintendent for tissue mill. Experienced, progressive and aggressive; must have converting know-how and ability to manage men. Complete resume required. Address Box 54-114 care Paper Trade Journal. A-9

SALES REPRESENTATIVE: Experienced in selling Resin Coated and Printed Paper. Knowledge of specialty bags helpful. Age 30 to 45. Progressive company—opportunity for advancement. Salary open—liberal management benefits. Send complete resume with recent snapshot to Box 53-423 care Paper Trade Journal. TF

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SITUATION WANTED

Superintendent or Tour Boss. 24 yrs. experience on Fourdriniers making Kraft, Crepes, Specialties. Also Finer & Medium corrugated board. Age 44, married, High School Ed. Excellent Health. Address Box 54-116 care Paper Trade Journal. A-2

TECHNICAL EXECUTIVE—Age 40. 15 years diversified experience in paper, paper converting, adhesives, coatings and resins, seeks top connection in sales, development or manufacturing. Address Box 54-102 care Paper Trade Journal. A-2

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MAN age 43, with 25 years experience on cylinder machines, now working as Tour Boss in South America, wishes employment as Machine Tender or Tour Boss. Prefer foreign employment. Good references. Will go anywhere. Address Box 54-108 care Paper Trade Journal. A-9

ASSISTANT TO AN EXECUTIVE IN CHARGE OF PULP PRODUCTION COSTS

Well versed in the new developments (involving the cleaning of rough woods, wood chips and pulps, and the most recent pulping and bleaching procedures) in the utilization of waste or rough woods without lowering the end-use qualities of standard pulps. Ph.D. training, presently employed, married. Strong background in applied research with some mill experience. Address Box 54-91 Paper Trade Journal. NC

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Available—Reputable profit-maker in designing, procuring materials and facilities, modern manufacturing and printing procedures, marketing & office methods for paper converted merchandise such as tablets, loose leaf fillers, zipper & regular binders, coil bound & sewed books, transparent wrapped & boxed stationery, commercial envelopes, regular & specialty bags, decorated films & foil, set up boxes and cartons. Address box 54-125 care of Paper Trade Journal. A-8

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WANTED—Good used Valley Iron Works, Niagara Type 1½ lb. Beater, with controlled bedplate. Desintegrator for the same. When offering, give information as to the condition of the equipment and price. Address Box 54-115 care Paper Trade Journal. A-9

WANTED—Good, used supercalender, 7 or 9 Roll Stack, 63" to 70" Face Rolls, with Anti-Friction bearings. Give complete information. Address Box 54-122 care Paper Trade Journal. M-26

WANTED—Slitting and rewinding machine around 60" in width. American Cordage Company, 314 Straight, SW., Grand Rapids, Michigan. A-9

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Wanted — one Lawtomatic Toilet Roll Wrapper Model B — State Price & Serial No. Address Box 54-124 care Paper Trade Journal A-2

WANTED
Used Converting Equipment

For Specialty Heavy Duty Industrial Shipping Containers, IE. Tubing, and Cutting Equipment. Address Box 54-120 care Paper Trade Journal. A-16

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FOR SALE

110" Hamblet Sheeter.
60" Finlay Sheeter.
40" Clark Single Sheeter.
48" Kidder model CH Slitter.
28" Hobbs shear cut Slitter.

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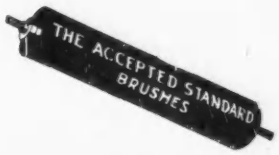

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Dryers

10—Rice Barton Dryers 48" dia., 124" face.
10—Black-Clawson Dryers 42" dia., 130".
6—Rice Barton Dryers 48" dia., 98" face.
11—Black-Clawson Dryers 36" dia., 114" face.
7—Black-Clawson Dryers 36" dia., 82" face.
32—Sandy Hill Dryers 36" dia., 73" face.
38—Black-Clawson Dryers 48" dia., 46" face.
1—Rice Barton Dryer 36" dia., 103" face.
3—Sandy Hill Dryers 36" dia., 104" face.
1—Pusey & Jones Dryer 48" dia., 104" face.
2—Bagley & Sewall Dryers 28" dia., 120" face.

Calender Stacks

1—11-Roll, 114" face, Sandy Hill.
2—8-Roll, 82" face, Black-Clawson.
1—7-Roll, 72" face, Farrel Birmingham.
1—3-Roll, 62" face, Farrel Birmingham.

Reels

1—84" Bagley & Sewall, Pope Type.
1—96" Bagley & Sewall, Pope Type.
2—76" Black-Clawson two-spool Reel.
1—68" Smith & Winchester 2-spool Reel.
1—112" Bagley & Sewall 2-spool Reel.

Winder & Slitters

1—84" Cameron, Type 10 Model A with backstands.
1—86" Johnstone (New in 1949).
1—86" Langston, will make 50" dia. rolls.
1—118" Beloit, (anti-friction bearings), motor drive.
1—108" Pusey & Jones, anti-friction bearings.
1—120" Pusey & Jones, anti-friction bearings.
1—194" Trim Beloit, was running 2350 F.P.M.
1—74" Bagley & Sewall, two-drum.
1—78" Moore & White, 4-drum.

Trimmers & Sheeters

1—84" 20th Century Seybold Trimmer, rebuilt.
1—76" 20th Century Seybold Trimmer, rebuilt.
1—48" Oswego, (very reasonable).
1—82" Hamblet Rotary Sheeter.
1—76" Hamblet Rotary Sheeter, with backstands.

Beaters & Jordans

1—Dilts Breaker Beater, Keyed Bandless roll, 72" dia., 60" face, cast iron tub 35" long, 3000# capacity (new bars and stands).
1—E. D. Jones 25# Laboratory Beater, roll bronze filled.
2—1800# Valley Iron Works, cast iron tubs.
1—800# Valley Iron Works (new bronze fillings).
3—Dilts Keyed Bandless rolls, steel spindles, alloy bars, with or without tubs.
1—E. D. Jones, 2000# capacity, Roll 67 x 60".
1—E. D. Jones, 53" dia., 48" face beater roll. New 1949, 2 Sets New Fillings, (A buy).

1—Noble & Wood Pony Monarch Jordan, anti-friction bearings, designed for direct connecting. New fillings.
2—Noble & Wood Pony Jordans, belt driven.
1—Noble & Wood Pony Monarch Jordans, B.D.
1—Appleton No. 1, designed for direct connecting.

Pumps

1—No. 8 Nash Hytor with Motor.
2—No. 6L Nash Vacuum Pumps (like new).
1—No. 5L Nash Vacuum Pump (all bronze).
—No. 1 Nash Hytor, (new rotor & bearings).
4—Beloit 10" to 8" low head Fan Pumps.
2—10" x 20" Shartle Triplex Plunger Pumps.
1—8" x 20" Beloit Triplex Plunger Pump.
4—5" x 8" Moore & White Duplex Plunger Pumps.
1—8" x 10" Deane Triplex Plunger Pump.
2—8" x 18" Shartle Duplex Plunger Pump.
5—Warren Centrifugal Pumps, 3000 G.P.M.
1—Frederick 12" x 8", 2700 G.P.M., 102 F.H.
3—Shartle Agiflow Stock Circulating Pumps.

Press Sections

1—Complete 84" Size Press.
1—Complete 84" Reverse Second Press.
1—Complete 84" Press and Pick-up Felt.
1—Complete 120" Smoothing Press.
1—Complete 74" First Press.

Press Rolls

2—25" dia., 154" face Suction Pres Rolls.
6—16" dia., 82" face R. C. Press Rolls.
3—16" dia., 82" face Brass Covered Press Rolls.
3—17" dia., 77" face R. C. Press Rolls.
2—17" dia., 77" face Brass Covered Press Rolls.
3—17" dia., 149" face R. C. Press Rolls.
2—17" dia., 149" face Brass Covered Press Rolls.
1—28" dia., 148" face R. C. Press Rolls.
Just a few of the several hundred available.

Miscellaneous

7—42" dia., 144" face Hollow Shaft Cylinder Moulds, anti-friction bearings.
2—30" dia., 76" face Cylinder Moulds.
1—36" dia., 134" face Cylinder Moulds.
1—48" dia., 76" face Cylinder Moulds.
1—30" dia., 53" face Cylinder Moulds.
6—New Felt Stretches with 1-7/16" bronze screws.

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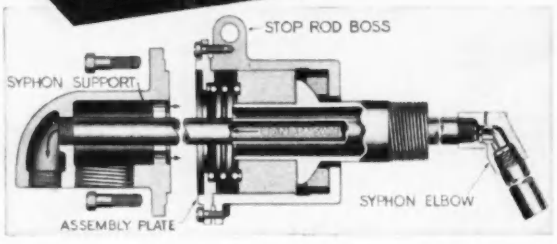
New Self-Supporting TYPE SDP
JOHNSON JOINT
with Syphon Elbow



Here's a combination of new ideas that is getting a big welcome from the paper industry. It consists of the self-supporting Type S Johnson Joint — now with streamlined design for lighter weight, less cost and longer life of the wearing parts — with the addition of assembly plate and syphon elbow. Plate holds internal parts in position when head is removed to get at the syphon pipe. And syphon elbow permits use of straight pipe for syphon connections. Elbow seals tightly when in position, allows pipe to be inserted or withdrawn right through the joint body.

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Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
Nichols Engrg. & Research Corp.
Ross, J. O., Engrg. Co.
Shartle Brothers Machine Co.

CHAINS
Jeffrey Mfg. Co.
Link Belt Co.

CHEMICAL COTTON PULP
Hercules Powder Co.

CHEMICAL SPRAYS
Vapo Systems Co.

CHEMICALS
American Cyanamid Co., Industrial Chem. Div.
Antara Chemicals Division, General Dyestuff Corp.
Arnold, Hoffman & Co., Inc.
Calgon, Inc.
Columbia-Southern Chem. Corp., Sub. of Pittsburgh Plate Glass Co.
Diamond Alkali Co.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., Inc.
B. F. Goodrich Chemical Co.
Gottesman & Co.
Hercules Powder Co.
Heyden Chemical Corp.
Hooker Electrochemical Co.
Koppers Company, Inc.
Monsanto Chemical Company
National Aluminate Corp.
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Pennsylvania Indust. Chem. Corp.
Rohm & Haas Company
Wyandotte Chemicals Corp., Michigan Alkali Div.

CHESTS
The Bagley & Sewall Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Midwest Fulton Mch. Co.
Shartle Bros. Mch. Co.

CLAYS
United Clay Mines

CLEANING MATERIALS
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuffs Corp.
Arnold, Hoffman & Co., Inc.
Columbia-Southern Chem. Corp., Sub. of Pittsburgh Plate Glass Co.
Diamond Alkali Co.
The Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
Monsanto Chemical Company
Nopco Chemical Co.
Wyandotte Chemicals Corp., J. B. Ford Division

CLUTCHES
Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dodge Mfg. Corp.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Horton Mfg. Co., Inc.
Hudson-Sharp Mch. Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.

COARSE SCREENS
Bird Machine Company

COATING & BRIGHTENING AGENTS
Burgess Pigment Co.

COATING MACHINERY
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Hudson Sharp Machine Co.
The Mayer Machine Co., Inc
Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G., & Co., Inc

COATING MATERIALS
American Cyanamid Company, Industrial Chemicals Division
Burgess Pigment Co.
The Dow Chemical Co.
E. I. du Pont de Nemours & Co., Inc.
B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Hercules Powder Co.
J. M. Huber Corp.
Koppers Company, Inc.
Monsanto Chemical Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Thiele Kaolin Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

COATINGS, CORROSION PROOF
Insul-Mastic Corp. of America

COATING ROLLS
Stone, Thos. & Geo. M., Inc.

COMPRESSORS
Moorhead Elec. Machy. Co.
Nash Engineering Co.
Read Standard Corp.
Roots-Connersville Blower Corp.

CONDENSATE FILTERS
Hungerford & Terry, Inc.

CONDENSATION CONTROL
Insul-Mastic Corp. of America

CONDENSERS
Elliott Company, Inc.
Midwest Fulton Mch. Co.
Westinghouse Elec. Corp.

CONDITIONERS
Vapo Systems Co.

CONDUITS
Aluminum Co. of America

CONSISTENCY REGULATORS
Bird Machine Company
DeZurik Shower Company
Pandia, Inc.

CONSULTING ENGINEERS
Cummins & Barnard, Inc.
Ebasco Services
Frank W. Egan & Co.
Ferguson, H. K., Company
Alvin H. Johnson & Co., Inc
Kalamazoo Sheet Metal Mfg. Co.
R. C. Mahan Co.
Main, Inc., Chas. T.
Rust Engrg. Co
J. E. Sirrine & Co.
Vapo Systems Co.
John Waldron Corp.

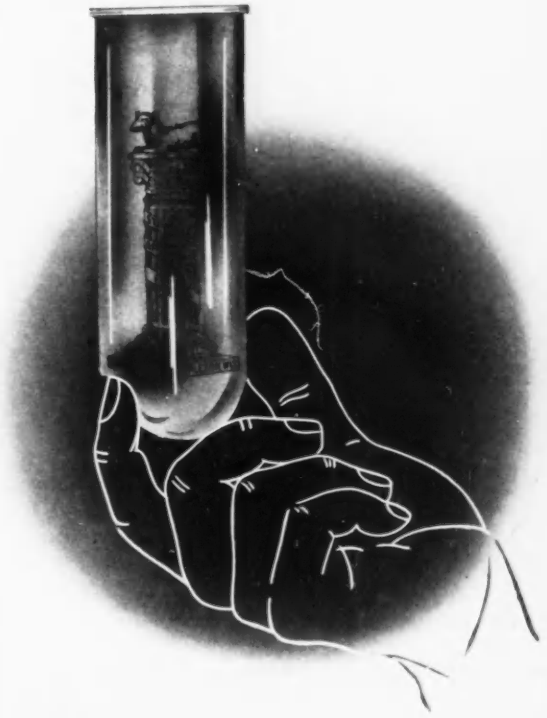
CONTINUOUS DIGESTER
Pandia, Inc.

CONTROLLERS
Black Clawson Company

CONTROLS
Airmatic Valve, Inc.
Johnson Corp.
Poirier Control Co.
Ronningen-Petter Co.
Shartle Brothers Machine Co.
Westinghouse Electric Corp.

CONVERTING MACHINERY
The Bagley & Sewall Company
Dilts Machine Works
Egan, Frank W., & Co.
Hudson Sharp Machine Co.
Paper Converting Machine Co.
Potdevin Machine Co.
Waldron, John, Corp.

CONVEYORS
Black Clawson Company



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EGGSHELL • INDEX BRISTOL • CUP AND CONTAINER
ENVELOPE • MIMEOGRAPH • FILE FOLDER • COATED
ENGLISH FINISH • POSTCARD • MACHINE COATED

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KRAFT CONVERTING AND KRAFT ENVELOPE

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Mill Roll Headers

Here is the modern, cost-saving method of header labeling . . . and portable to move right to the rolls being "headed." Patented regulator applies controlled film of glue.

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Enterprise Company
Jeffrey Mfg. Co.
Link Belt Co.
Murray, D. J., Mfg. Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.

CORES
Elixman Paper Co.
Mead Board Sales, Inc.
Mercer Paper Tube Co.
Sonoco Products Co.

CORROSION RESISTANT COATINGS
Insul-Mastic Corp. of America

COTTON LINTER
Hercules Powder Co., Inc.
Railway Supply & Mfg. Co.

COUCH ROLLS
Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
Improved Machinery Inc.
Manchester Machine Co.
Stowe-Woodward Inc.
Tyer Rubber Co.

COUPLINGS
Ajax Flexible Coupling Co.
The Bagley & Sewall Company
Black Clawson Company
Downingtown Mfg. Co.
Emerson Mfg. Co.
Farrel-Birmingham Co., Inc.
Hermann Mfg. Co.
E. D. Jones & Sons Co.
Dodge Mfg. Corp.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John

CRANES
Whiting Corp.

CURL TESTERS
Testing Machines, Inc.
Thwing-Albert Instrument Co.

CUTTERS
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson Sharp Machine Co.
Moore & White Co.
Perkins & Son, Inc., B. F.
The Sandy Hill Iron & Brass Works
The Smith & Winchester Mfg. Co.
Taylor, Stiles & Co.

CYLINDER MOULDS
Black Clawson Company
Downingtown Mfg. Co.
Improved Machinery Inc.
Manchester Machine Co.

CYLINDERS
M. W. Jenkins Sons, Inc.

CYLINDER WIRES
Lindsay Wire Weaving Co.
Wisconsin Wire Works

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DEAERATING FEEDWATER HEATERS
Elliott Company, Inc.

DECKLE SHOWERS
Ronningen-Petter Co.

DECKLE STRAPS
Stowe-Woodward Inc.

DECKLE WEBBING
Williams-Gray Co.

DEFOAMERS
Arnold, Hoffman & Co., Inc.
Houghton & Co.

DEINKING
Bird Machine Co.
Dilts Machine Works
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DEINKING CHEMICALS
Antara Chemicals Division, General Dyestuffs Corp.
E. I du Pont De Nemours & Co., Inc.
Jackson & Church Co.
Nopco Chemical Co.

DE-MINERALIZING EQUIPMENT
Hungerford & Terry, Inc.

DENSOMETERS
Testing Machines, Inc.
W. & L. E. Gurley

DESIGN CONSTRUCTION
Ebasco Services

DETERGENTS
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuffs Corp.
Arnold, Hoffman & Co., Inc.
Calgon, Inc.
Diamond Alkali Co.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Company
Wyandotte Chemicals Corp., Michigan Alkali Div.

DEWAXING CHEMICALS
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuffs Corp.
Arnold, Hoffman & Co., Inc.
Nopco Chemical Co.

DIGESTER CIRCULATING SYSTEMS
Sandy Hill Iron & Brass Works

DIGESTERS
Babcock & Wilcox Co.
Bauer Bros. Co.
Blaw Knox Company
Chicago Bridge & Iron Co.
Graver Tank Mfg. Co.
Pandia, Inc.
Pusey & Jones Corp.
A. O. Smith Corp.

DISPERSING AGENTS
Antara Chemicals Division, General Dyestuff Corp.
Arnold, Hoffman & Co., Inc.
Calgon, Inc.
Diamond Alkali Co.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Company
Wyandotte Chemicals Corp. Michigan Alkali Div.

DOCTORS
The Bagley & Sewall Company
Bird Machine Company
Black Clawson Company
Downingtown Mfg. Co.
Lobdell United Co.
Lodding Engineering Corp.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co

DOCTOR BLADES
The Bagley & Sewall Company
Bird Machine Company
Black Clawson Company
John W. Bolton & Sons, Inc.
Lodding Engineering Corp.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Simonds Saw & Steel Co.
Westinghouse Electric Corp.

DOCTOR OSCILLATORS
Ronningen-Petter Co.

DRIERS
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Jackson & Church Co.
Lukenweld
Mahon, R. C., Co.
The Moore & White Co.
Murray Mfg. Co., D. J.
I. J. Ross Company
Red-Ray Mfg. Co., Inc.
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co
Valley Iron Works Co.

DRIERS—LABORATORY
Testing Machines, Inc.

DRILLED SUCTION COUCH ROLLS
Downingtown Mfg. Co.
Manchester Machine Co.

DRILLED SUCTION DRUM ROLLS
Downingtown Mfg. Co.
Manchester Machine Co.

DRIVES
Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Bird Machine Co.
Black Clawson Company
Dodge Mfg. Corp.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Horton Mfg. Co.

Jeffrey Mfg. Co.
General Electric Company
Gibbs-Brower Company, Inc.
Link Belt Co.
Manchester Machine Co.
Moore & White Co.
Murray, D. J., Mfg. Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

DRUM WINDERS
Black Clawson Company
Downingtown Mfg. Co.
Manchester Machine Co.

DRYER ROLL PYROMETER
Midwest Fulton Mch. Co.
Testing Machines, Inc.
Thwing-Albert Instrument Co.

DUSTERS
Appleton Machine Co.
Frank W. Egan & Co.
M. W. Jenkins Sons, Inc.
E. D. Jones & Son Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Waldron, John, Corp.

DUSTING BRUSHES
M. W. Jenkins Sons, Inc.

DYESTUFFS
Ciba Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The
General Dyestuff Corp.

ELECTRIC HYDROMETER
Testing Machines, Inc.

ELECTRIC HYGROMETER
Thwing-Albert Instrument Co.

ELECTRICAL PRECIPITATORS
Research Corporation

EMBOSSING MACHINES
Dilts Machine Works
Egan, Frank W., & Co.
Hudson Sharp Machine Co.
Paper Converting Machine Co.
Potdevin Machine Co.
John Waldron Corp.

EMBOSSING ROLLS
The Appleton Machine Co.
Gibbs-Brower Company, Inc.
Holyoke Machine Co.
Hudson Sharp Machine Co.
B. F. Perkins & Son, Inc.
Stone, Thos. & Geo. M., Inc.
John Waldron Corp.

EMPLOYMENT SERVICE
Bixby, R. W., Inc.
Raymond, Chas. P., Service, Inc.

EMULSIFIERS
Antara Chemicals Division, General Dyestuff Corp.
Arnold, Hoffman & Co., Inc.
Nopco Chemical Co.
Rohm & Haas Company
Wyandotte Chemicals Corp.

ENZYMES
Rohm & Haas Company
Vanderbilt Co., R. T.

EVAPORATORS
Jackson & Church Co.
Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.
Westinghouse Electric Corp.

EXPANDERS
Mount Hope Machinery Co.

FABRICATORS
R. C. Mahon Co.
Ronningen-Petter Co.

FANS
Buffalo Pumps, Inc.
General Electric Co.
B. F. Perkins & Son, Inc. Roots-Connersville Div.
Ross Engineering Co., J. O.
Westinghouse Electric Corp.

FEEDERS
Jeffrey Mfg. Co.
Merrick Scale Mfg. Co.

FELTS
Albany Felt Co.
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Draper Bros. Corp.
Huyck & Son, F. C.
Knox Woolen Company
Lockport Felt Co.
Morey Paper Mill Supply Co
Shuler & Benninghofen
Waterbury Felt Co.
Williams-Gray Co.

FELT CLEANERS
Antara Chemicals Division, General Dyestuff Corp.
Calgon, Inc.
Nopco Chemical Co.

FELT CONDITIONERS
Bird Machine Co.
Downingtown Mfg. Co.
Mount Hope Machinery Co.
The Sandy Hill Iron & Barss Works

FELT EXPANDERS
Mount Hope Machinery Co.

FELT GUIDES
Black Clawson Company
Downingtown Mfg. Co.
Frank W. Egan & Co.
Gilbert & Nash Co.
Moore & White Co.
The Noble & Wood Machine Co.
Mount Hope Machinery Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FELT PRESERVERS
Mount Hope Machinery Co.

FELT SHOWERS
Ronningen-Petter Co.

FIBRE BOARD MACHINES
Black Clawson Company
Sandy Hill Iron & Brass Works

FIBRE GLASS
Pittsburgh Plate Glass Co.

FILLERS
American Cyanamid Company, Industrial Chemicals Division
J. M. Huber Corp.
A. M. Meincke & Son, Inc.
Thiele Kaolin Co.
Vanderbilt Co., R. T.
Wyandotte Chemicals Corp., Michigan Alkali Div.

FILLINGS
Bahr Bros. Mfg. Co.
John W. Bolton & Sons, Inc.
Ronningen-Petter Co.
Shartle Brothers Machine Co.

FILTER MEDIA
Hungerford & Terry, Inc.
Palmer Filter Equipt. Co.

FILTERS
Bird Machine Company
Holyoke Machine Co.
Hungerford & Terry, Inc.
Improved Machinery Inc.
Johnson Corp.
Moore & White Co.
Ronningen-Petter Co.
J. O. Ross Engrg. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Walworth Company

FILTERS, LIME MUD
Bird Machine Company

FILTER SCREENS
Ronningen-Petter Co.

FINE SCREENS
Bird Machine Company
Sandy Hill Iron & Brass Works

FITTINGS
The Bagley & Sewall Company
Crane Company
Grinnell Company
Pittsburgh Piping & Equipt. Co.
Shartle Brothers Machine Co.
Walworth Company

FLEXIBLE COUPLINGS
Dodge Manufacturing Corp.
Egan, Frank W., & Co.
Elliott Company, Inc.
Jeffrey Mfg. Co.
Shartle Brothers Machine Co.
John Waldron Corp.
Westinghouse Electric Corp.

FLOORING, GRATING AND TREADS
The Goodyear Tire & Rubber Company
Norton Co.

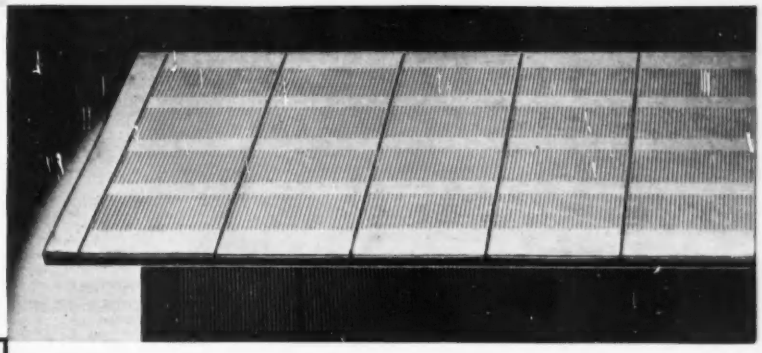
FLOTATION EQUIPMENT
Ronningen-Petter Co.
Walker Process Equipment, Inc.

FLOW BOXES
Lukens Steel Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

FLUID FILTERS
Ronningen-Petter Co.

MAGNUS THIN-SHEET SCREEN PLATES

for
High Sustained Yield
of
CLEANER PULP



MAGNUS METAL CORPORATION
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Subsidiary of **National Lead Company**

Metalworkers for the Paper Trade

SCREEN PLATES: BRONZE, CHROME NICKEL-STEEL, AND INCONEL

VALVES: GATE, SWING CHECK, BLOW, GLOBE, ANGLE AND "Y"

Magnus screen plates, made of chrome-nickel-steel or inconel, have a high-strength, thin sheet design that's specially engineered for maximum flow. About 40,000 of these plates are now in service, with performance records that prove these three important advantages:

1. Increased Capacity

The thin sheet eliminates relief milling, and with recommended arrangement, substantially increases capacity per plate.

2. Longer Life

Slots remain sharp, side walls highly polished for the life of the plate. There's greatly improved corrosion resistance, too.

3. High, Sustained Yield

Thin-sheet screen plates assure consistent, uniform quantities of cleaner pulp. This means improved production at reduced operating costs.

Complete information is yours on request. Or if you like, we'll gladly have an engineer call.

HOLDERS
Emerson Mfg. Co.
Hudson Sharp Machine Co.

FORMATION TESTERS
Testing Machines, Inc.
Thwing-Albert Instrument Co.

FOURDRINIERS
Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
Manchester Machine Co.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

FREENESS TESTERS
Testing Machines, Inc.
Williams Apparatus Co.

GASKETS
B. F. Goodrich Co.
The Goodyear Tire & Rubber Company

GEAR MOTORS
Elliott Company, Inc.
Westinghouse Electric Corp.

GEAR REDUCERS
Dodge Mfg. Corp.
Downingtown Mfg. Co.

GEAR REDUCER DRIVES
Link Belt Co.

GEARS
The Bagley & Sewall Company
Black Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

GRAPHIC MACHINERY
Dilts Machine Works
Hudson Sharp Mch. Co.
Lyddon & Co.
Parsons & Whittemore
Potdevin Machine Co.

GRAPPLES
Blaw-Knox Company
Owen Bucket Co.
Wellman Engrg. Co.

GRATINGS
Blaw-Knox Co.

GRINDERS
Carthage Machine Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Hanchett Mfg. Co.
Lobdell United Co.
Norton Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
Norton Company
Simonds Abrasive Co.

GUIDES
The Bagley & Sewall Company
Beloit Iron Works
Black-Clawson Co.
Downingtown Mfg. Co.
Egan, Frank W., & Co.
Gilbert & Nash Co.
The Moore & White Co.
Mount Hope Machinery Co.
Sandy Hill Iron & Brass Works
Waldron, John, Corp.

GUMMING MACHINES
Dilts Machine Works
Egan, Frank W., & Co.
Paper Converting Machine Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Waldron, John, Corp.

GUMS
Hercules Powder Co., Inc.
National Starch Products, Inc.

HEAT EXCHANGERS AND RECOVERY SYSTEMS
Mahon, R. C., Co.
Westinghouse Electric Corp.

HEATING, VENTILATING & AIR CONDITIONING
The Appleton Machine Co.
E. D. Jones & Sons Co.
General Electric Co.
Jackson & Church Co.
D. J. Murray Mfg. Co.
Red-Ray Mfg. Co., Inc.
Ross Engineering Corp., J. O.
Valley Iron Works Co.
Westinghouse Electric Corp.

HONING KIT
John W. Bolton & Sons, Inc.

HOODS
Kalamazoo Sheet Metal Mfg. Co.

HOSE (Air, Water, Suction, etc.)
B. F. Goodrich Co.
The Goodyear Tire & Rubber Company

HUMECTANTS
Aktivin Division, Heyden Chemical Corp.
Arnold, Hoffman & Co., Inc.
Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

HYDRAULIC OSCILLATING SHOWERS
Ronningen-Petter Co.

HYDRAULIC TURBINES & ACCESSORIES
James Leffel Co.

IMPREGNANTS
American Cyanamid Company, Industrial Chemicals Division
Sun Oil Company
B. F. Goodrich Chemical Co.

INDENTING MACHINES
Dilts Machine Works

INDUSTRIAL CONTROL
Westinghouse Electric Corp.

INDUSTRIAL TIRES
B. F. Goodrich Co.

INDUSTRIAL TRACTORS
Towmotor Corp.

INKOMETER
Thwing-Albert Instrument Co.

INSTRUMENTS, TESTING AND MEASURING
Black-Clawson Co.
General Electric Co.
W. & L. E. Gurley
B. F. Perkins & Son
Taylor Instrument Cos.
Testing Machines, Inc.
Thwing-Albert Instrument Co.
Tracerlab, Inc.
Westinghouse Electric Corp.

INSULATION
Insul-Mastic Corp. of America

JACKETS
Emerson Mfg. Co.

JOINTS
The Bagley & Sewall Company
Beloit Iron Works
Cram Associates
Downingtown Mfg. Co.
Johnson Corp.
Moore & White Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

JORDAN BARS
Ronningen-Petter Co.

JORDANS
Emerson Mfg. Co.
Ronningen-Petter Co.
Shartle Brothers Machine Co.

JORDAN FILLINGS
Appleton Machine Co.
Bahr Bros. Manufacturing Co.
John W. Bolton & Sons, Inc.
E. D. Jones & Sons Co.
Ronningen-Petter Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KILNS
Jackson & Church Co.
F. L. Smidth & Co.

KNIVES
Black Clawson Company
John W. Bolton & Sons, Inc.
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
The Moore & White Co.
Shartle Brothers Machine Co
Simonds Saw & Steel Co.
Taylor Stiles & Co.
Valley Iron Works Co.

KNOTTERS
Black Clawson Company
Improved Machinery, Inc.
Sandy Hill Iron & Brass Works

LABORATORY CORRUGATOR
Testing Machines, Inc.
Thwing-Albert Instrument Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
Bauer Brothers Co.
Bird Machine Company
Dilts Machine Works
Downingtown Mfg. Co.
W. & L. E. Gurley
Egan, Frank W., & Co.
Hermann Mfg. Co.
Jackson & Church Co.
E. D. Jones & Sons Co.
Ronningen-Petter Co.
Shartle Brothers Machine Co.
Taylor Instrument Companies
Testing Machines, Inc.
Thwing-Albert Instrument Co
Valley Iron Works Co.
Waldron, John, Corp.

LAMINATING MACHINES
The Bagley & Sewall Company
Dilts Machine Works
Egan, Frank W., & Co.
Hudson Sharp Machine Co.
Paper Converting Machine Co
Potdevin Machine Co.
Waldron, John, Corp.

LAY BOYS
Dilts Machine Works
Gibbs-Brower Company, Inc.
Hamblet Machine Co.
Moore & White Co.

LINTER PULP
Hercules Powder Co., Inc.

LUBRICANTS
Cities Service Oil Co.
Gulf Oil Corp.
Houghton & Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co.
The Texas Company

MACHINERY, CARBON PAPER
Haida Engineering Co.

MAGAZINE REELS
Dilts Machine Works

MAGNETIC SEPARATORS
Bauer Bros. Co.
Shartle Brothers Machine Co.

MATERIALS HANDLING
Dilts Machine Works
Downingtown Mfg. Co.
Jeffery Mfg. Co.
Link Belt Co.
Shartle Bros. Mch. Co.
Towmotor Corp.
The Wellman Engrg. Co.

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Lobdell Co.
Testing Machines, Inc.

MIXERS
Jackson & Church Co.
Mixing Equipment Co.
Walker Process Equipment, Inc.

MICRO-CRYSTALLINE WAXES
Sun Oil Company

MOISTURE CONTENT CONTROL
Testing Machines, Inc.
Vapo Systems Co.

MOISTURE METERS
Testing Machines, Inc.

MOTORS
Allis Chalmers Mfg. Co.
Elliott Company
Moorhead Elec. Machy. Co.

MOTORS AND GENERATORS
Elliott Company, Inc.
General Electric Company
Moorhead Elec. Machy. Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric Corp.

NICKEL AND NICKEL ALLOYS
The International Nickel Co.

PACKING BOXES
Johnson Corporation
The Moore & White Co.
Shartle Brothers Machine Co.

PAPER CONDITIONERS
Vapo Systems Co.

PAPER MACHINE DRIVES
The Bagley & Sewall Company
Beloit Iron Works
Black-Clawson Co.
Downington Mfg. Co.
Manchester Machine Co.
Moore & White Co.
Sandy Hill Iron & Brass Works
Westinghouse Electric Corp.

PAPER MACHINES
The Bagley & Sewall Company
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Lukenweld
Manchester Machine Co.
Moore & White Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machinery Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

PAPER MACHINE SLICES
Black-Clawson Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPER MILL MACHINERY
Ronningen-Petter Co.

PAPER TUBE MACHINERY
Dietz Machine Works
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson Sharp Machine Co.
Langston Co., Samuel M.
Paper Converting Machine Co.

PARAFFINE WAXES
Sun Oil Company

PARAFFIN WAX EMULSIONS
American Cyanamid Co., Ind. Chem. Div.
Arnold, Hoffman & Co., Inc.
Hercules Powder Co., Inc.
Nopco Chemical Co.

PASTING MACHINES
Beloit Iron Works
Black-Clawson Company
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

PEBBLE MILLS
F. L. Smidth & Co.

pH METERS
Testing Machines, Inc.
Thwing-Albert Instrument Co.

PHOTO GRAVURE ROLLS
Stone, Thos. & Geo. M., Inc.

PIPE
Aluminum Co. of America
Armco Drainage & Metal Products, Inc.
Babcox & Wilcox Co.
Crane Company
Grinnell Company
National Tube Co.
Walworth Company

PIPE FABRICATORS
Pittsburgh Piping & Equipt. Co.
Ronningen-Petter Co.

PIPE FITTINGS
Aluminum Co. of America
Armco Drainage & Metal Products, Inc.
Crane Company
Grinnell Company
Pittsburgh Piping & Equipt. Co.
Walworth Co.

PIPING, HIGH PRESSURE
Pittsburgh Piping & Equipt. Co.

PIPING (Piloweld Lines)
Goodyear Tire & Rubber Co.

PITCH CONTROL
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuff Corp.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Company

PLASTICIZERS
American Cyanamid Company Industrial Chemicals Company
Aktivin Division, Heyden Chemical Corp.
Arnold, Hoffman & Co., Inc.
B. F. Goodrich Chemical Co.
Jackson & Church Co.
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Rohm & Haas Company

PLATERS
Gibbs-Brower Company, Inc.
Perkins & Son, Inc., B. F

PLATES
Armco Steel Corp.
Babcock & Wilcox Co.

Lukenweld Division
Lukens Steel Company
L. O. Ross Engrg. Corp.
Timken Roller Bearing Co.

PLUGS
The Appleton Machine Co.
Black Clawson Company
Emerson Mfg. Co.
E. D. Jones & Sons Co.
Shartle Brothers Machine Co.

POPE TYPE REELS
Black-Clawson Company
Downingtown Mfg. Co.
Egan, Frank W., & Co.
Manchester Machine Co.
Moore & White Co.
Sandy Hill Iron & Brass Works

PRESERVATIVES
Antara Chemicals Division, General Dyestuff Corp.
E. I. du Pont de Nemours & Co.

PRESS ROLLS
Beloit Iron Works
Black-Clawson Co.
Downingtown Mfg. Co.
Goodrich, B. F., Company, Inc.
Manchester Machine Co.
Moore & White Co.
Sandy Hill Iron & Brass Works
Stowe-Woodward Inc.

PRESSURE FILTERS
Holyoke Machine Co.
Hungerford & Terry, Inc.
Jackson & Church Co.
Ronningen-Petter Co.
Sandy Hill Iron & Brass Works

PRESSURE VESSELS
Chicago Bridge & Iron Co.
Mahon, R. C., Co.
A. O. Smith Corp.

PRESSES
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
Dietz Machine Works
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Heinrich, H. H., Co.
Hudson-Sharp Machine Co.
Jackson & Church Co.
Manchester Machine Co.
The Moore & White Co.
Paper Converting Machine Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Testing Machines, Inc.
Valley Iron Works Co.
Waldron Corp., John
H. G. Weber & Co., Inc.

PRINTING ROLLS
Stone, Thos. & Geo. M., Inc.

PROTECTIVE COATINGS
Insul-Mastic Corp. of America

PULLEYS
Bird Machine Company
Black-Clawson Co.
Dodge Mfg. Corp.
Horton Mfg. Co., Inc.
Sandy Hill Iron & Brass Works

PULP CLASSIFIER
The Bauer Bros. Co.
Testing Machines, Inc.
Thwing-Albert Instrument Co.

PULP CLEANERS
Bauer Bros. Co.
Bird Machine Co.
Nichols Engrg. & Research Corp.
Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.

PULP REFINERS
Emerson Mfg. Co.
Shartle Bros. Machine Co.

PULP SCREENS
Bird Machine Co.
Murray, D. J., Mfg. Co.
Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.

PULP STOCK VALVES
Crane Company
Grinnell Company
Murray, D. J., Mfg. Co.
Record Fdy. & Mach. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

PULP WASHERS
Mundt, Chas. & Sons
Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.

PULPERS
Apmew, Inc.
Bauer Brothers Co.
Cowles Company
Curlator Corp.
Dilts Machine Works
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Midwest Fulton Mch. Co.
Morden Machines Co.
Shartle Brothers Machine Co.

PULPS
Brown Company
Gottesman & Co., Inc.
Lyddon & Co. (America), Inc.
Parsons & Whittemore, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.
Restigouche Co., Ltd.

PULPSTONES
Norton Company

PULP TESTERS
Testing Machines, Inc.

PULP TREATING
Curlator Corp.

PULVERIZING MILLS
Jeffery Mfg. Co.
F. L. Smidth & Co.

PUMP VALVE BALLS
Stowe-Woodward Inc.

PUMPS
Allis Chalmers Mfg. Co.
Apmew, Inc.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Buffalo Pumps, Inc.
DeLaval Steam Turbine Co.
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Read Standard Corp.
Ronningen-Petter Co.
Roots Connersville Blower Corp.
T. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

RADIANT BURNERS
Red-Ray Mfg. Co., Inc.

RAG COOKING PROCESSES
General Dyestuff Corp.
Rohm & Haas Company

RAG CUTTERS
Gibbs-Brower Company, Inc.
B. F. Perkins & Son, Inc.
Taylor-Stiles & Co.

RECOVERY SYSTEMS
Babcock & Wilson Co.
Chicago Bridge & Iron Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Peabody Engrg. Corp.
Pusey & Jones Corp.
Ross Engineering Corp., J. O.
Valley Iron Works Co.
Vulcan Copper & Supply Co.

REELS
The Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works (Kohler Systems)
Egan, Frank W., & Co.
Downingtown Mfg. Co.
Hudson-Sharp Mch. Co.
Manchester Machine Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.
Waldron, John, Corp.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Curlator Corp.
Dilts Machine Works
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Hermann Mfg. Co.
Jackson & Church Co.
E. D. Jones & Sons Co.
Morden Machines Co.
Murray, D. J., Mfg. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sutherland Refiner Corp.
Valley Iron Works

REFRACTORIES
Harbison-Walker Refractories Co.

STAINLESS STEEL TANKS

STAINLESS STEEL STUFF BOXES, STOCK LINES, FILTER BOX LINERS, and MEASURING TANKS custom fabricated to your specifications. STAINLESS STEEL replacements for copper installations. Certified Riveted or Welded Construction as specified.

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REGULATORS
Airmatic Valve, Inc.
Apmew, Inc.
Bird Machine Company
General Electric Co.
Improved Machinery Inc.
Johnson Corp.
Poirier Control Company
Shartle Brothers Machine Co.
Taylor Instrument Companies
Westinghouse Electric Corp.

RESINS
American Cyanamid Company, Plastics & Resins Division
Borden Company
The Dow Chemical Company
B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Hercules Powder Co.
Koppers Company, Inc.
Monsanto Chemical Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Pennsylvania Indust. Chem. Corp.
Rohm & Haas Company

ROLLS
Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Emerson Mfg. Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
B. F. Goodrich Co.
Holyoke Machine Co.
Lindsay Wire Weaving Co.
Lobdell United Co.
Manchester Machine Co.
The Moore & White Co.
D. J. Murray Mfg. Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Stone, Thos. & Geo. M., Inc.
Stowe-Woodward Inc.
Tyer Rubber Co.
U. S. Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

ROLL COVERS
The Goodyear Tire & Rubber Company
Stowe-Woodward Inc.
Tyer Rubber Co.

ROLL HANDLING EQUIPMENT
Dilts Machine Works

ROLL STANDS
Cameron Machine Co.
Dilts Machine Works
Frank W. Egan & Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
John Waldron Corp.
H. G. Weber & Co., Inc.

ROPE CARRIERS
Black Clawson Co.
Downingtown Mfg. Co.
The Moore & White Co.
The Sandy Hill Iron & Brass Works

ROTARY KILNS
F. L. Smidth & Co.

ROTARY SCREENS
Bird Machine Company

ROTARY STEAM JOINTS
Johnson Corp.
The Moore & White Co.
Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.

RUBBER COVERED ROLLS
Stowe-Woodward Inc.
Tyer Rubber Co.

RUBBER PRODUCTS
B. F. Goodrich Co.
The Goodyear Tire & Rubber Company
Stowe-Woodward Inc.
Tyer Rubber Co.

SAMPLE CUTTER
Testing Machines, Inc.
Thwing-Albert Instrument Co.

SATURANTS
B. F. Goodrich Chemical Co.

SATURATING MACHINES
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

SAVEALLS
Bird Machine Company
Bulkley, Dunton Processes, Inc.
Chicago Bridge & Iron Co.
Improved Paper Machinery Corp.
Moore & White Co.
Ronningen-Petter Co.
Shartle Bros. Machine Co.
Walker Process Equipment, Inc.

SAWS
Simonds Saw & Steel Co.
Moore & White Co.

SCALES
Merrick Scale Mfg. Co.
Testing Machines, Inc.

SCREEN PLATES
Bird Machine Company
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Testing Machines, Inc.

SCREENS
Appleton Wire Works
Appleton Machine Company
The Bagley & Sewall Company
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
E. D. Jones & Sons Co.
Moore & White Co.
Murray, D. J., Mfg. Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SCREENS, CHIP (Vibrating)
Link Belt Co.

SCREENS (Rotary)
Bird Machine Company

SHAKES
Black Clawson Company
Downingtown Mfg. Co.

SHAKE STICKS
Westinghouse Electric Corp.

SHEET MACHINES
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hermann Mfg. Co.
Hudson Sharp Machine Co.
Ronningen-Petter Co.
Testing Machines, Inc.
Valley Iron Works Co.

SHOWER PIPES
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Emerson Mfg. Co.
Moore & White Co.
Ronningen-Petter Co.
Sandy Hill Iron & Brass Works
Sandusky Fdy. & Mch. Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.
Gibbs-Brower Company, Inc.
Jackson & Church Co.
Jeffrey Mfg. Co.
Taylor, Stiles & Co.

SIZE PRESSES
Black-Clawson Co.
Downingtown Mfg. Co.
Manchester Machine Co.
Moore & White Co.
Sandy Hill Iron & Brass Works

SIZING
American Bitumuls & Asphalt Co.
American Cyanamid Company, Industrial Chemicals Division
The Dow Chemical Company
du Pont, E. I., de Nemours & Co.
Glidden Company
Hercules Powder Co.
The Hubinger Co.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

SIZING TESTER
W. & L. E. Gurley
Testing Machines, Inc.
Thwing-Albert Instrument Co.

SLIME CONTROL
Antara Chemicals Division, General Dyestuff Corp.
The Dow Chemical Company
E. I. du Pont de Nemours & Co.
Monsanto Chemical Co.
National Aluminate Corp.
Rohm & Haas Company
Vanderbilt Co., R. T.
Wyandotte Chemicals Corp., Michigan Alkali Div.

SLITTERS
The Bagley & Sewall Company
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Dilts Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson-Sharp Mch. Co.
Improved Machinery Inc.
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Paper Converting Machine Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

SMOKE STACKS
Chicago Bridge & Iron Co.

SOFTNESS-STIFFNESS TESTER
W. & L. E. Gurley
Testing Machines, Inc.
Thwing-Albert Instrument Co.

SOLUBLE OILS
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuff Corp.
Arnold, Hoffman & Co., Inc.
Nopco Chemical Co.

SOLVENTS
Pennsylvania Ind. Chem. Co.

SPECIAL MACHINERY
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Egan, Frank W., & Co.
Jackson & Church Co.
Mahon, R. C., Co.
Manchester Machine Co.
Moore & White Co.
Murray, D. J., Mfg. Co.
Paper Converting Machine Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.
Waldron, John, Corp.

SPEED REDUCERS
Dodge Manufacturing Corp.
Downingtown Mfg. Co.
Link Belt Co.
Westinghouse Elec. Corp.

SPLICING TISSUE
Williams-Gray Co.

STAINLESS AND ALLOY CASTINGS
Michigan Steel Casting Co.

STAINLESS STEEL
Armco Steel Corp.
Crucible Steel Co.
U. S. Steel Corp.

STARCH
Clinton Foods, Inc.
Corn Products Sales Co.
The Hubinger Co.
National Starch Products, Inc.

STEAM JET EJECTORS
Elliott Company, Inc.

STEAM JOINTS
The Moore & White Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

STEAM SPECIALTIES
Babcock & Wilcox Co.
Johnson Corp.

STEEL
Armco Steel Corp.
Carnegie Illinois Steel Co.
Crucible Steel Co.
Lukens Steel Company
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
U. S. Steel Corp.

STEEL, CLAD
Babcock & Wilcox Co.
Lukens Steel Company

STEEL TANKS
Chicago Bridge & Iron Co.
Jackson & Church Co.
Mahon, R. C., Co.
Ronningen-Petter Co.
The Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.

STOKERS
Westinghouse Elec. Corp.

STRAINER SCREENS
Ronningen-Petter Co.

STRAINERS
Elliott Company, Inc.
Ronningen-Petter Co.

STRETCH TESTER
Testing Machines, Inc.
Thwing-Albert Instrument Co.

STUFF CHESTS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

STUFF BOXES
Kalamazoo Sheet Metal Mfg. Co.

SUCTION BOX COVERS
Appleton Wood Products
Emerson Mfg. Co.
Moore & White Co.
Westinghouse Electric Corp.

SUCTION BOXES
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
E. D. Jones & Son Co.
Manchester Machine Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co

SUCTION ROLLS
Beloit Iron Works
Downingtown Mfg. Co.
Manchester Machine Co.

SULPHUR
Texas Gulf Sulphur Co.

SULPHUR BURNERS
Valley Iron Works Co.

SULPHUR DIOXIDE
Virginia Smelting Co.

SUPERCALENDERS
The Appleton Machine Co.
B. F. Perkins & Son, Inc.

SWITCHGEAR
Westinghouse Elec. Corp.

SYNTHETIC LATICES
American Cyanamid Company, Industrial Chemicals Division
B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.

SYNTHETIC RESINS
American Cyanamid Co., Ind. Chem. Div.
Hercules Powder Co., Inc.
Pennsylvania Ind. Chem. Co.
Rohm & Haas Company

SYPHONS
Poirier Control Company
Shartle Bros. Machine Co.

TAILING SCREENS
Sandy Hill Iron & Brass Works

TAKE OFF UNITS
Dilts Machine Works

TALC
American Cyanamid Company, Industrial Chemicals Division
Vanderbilt Co., R. T.

TANKS
Chicago Bridge & Iron Co.
Graver Tank Mfg. Co.
Kalamazoo Sheet Metal Mfg. Co.
Mahon, R. C., Co.
B. F. Perkins & Sons, Inc.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Stebbins Engrg. Co.

TEARING TESTERS
Thwing-Albert Instrument Co.
Testing Machines, Inc.

TENSILE TESTERS
B. F. Perkins & Son, Inc.
Testing Machines, Inc.
Thwing-Albert Instrument Co.

THICKENERS, DECKERS AND SAVEALLS
The Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Chicago Bridge & Iron Co.
Dilts Machine Works
Downingtown Mfg. Co.
Improved Machinery Inc.
Moore & White Co.
D. J. Murray Mfg. Co.
Ross Paper Machinery Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co
Valley Iron Works Co.
Walker Process Equipment, Inc.

TITANIUM
E. I. du Pont de Nemours & Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.

TOOLS
Walworth Company

TRACTORS AND TRUCKS
Towmotor Corp.

TRANSFORMERS
Moorhead Elec. Machy. Co.
Westinghouse Elec. Corp.

TRANSMISSIONS
Dodge Mfg. Corp.
Jeffrey Mfg. Co.
Link Belt Co.

TRAPS
Crane Co.
Grinnell Company
Johnson Corporation
Shartle Brothers Machine Co.

TUBE CLEANERS
Elliott Company, Inc.

TUBE MILLS
F. L. Smidth & Co.

TUBES
Aluminum Co. of America
Babcock & Wilcox Co.
Crucible Steel Co.
National Tube Co.

TUBING MACHINES
Dilts Machine Works

TUBING, MECHANICAL
National Tube Co.

TURBINES
De Laval Turbine Co.
Elliott Company, Inc.
General Electric Company
James Leffel Co.
Westinghouse Electric Corp.

UNWINDERS
Dilts Machine Works
Downingtown Mfg. Co.
Egan, Frank W., & Co.
Moore & White Co.
Waldron, John, Corp.

USED EQUIPMENT
Gibbs-Brower Co.
Thomas W. Hall Co.
Moorhead Elec. Machy. Co.
J. J. Ross Company
Ross Paper Machinery Co.
Shartle Brothers Machine Co.

V-BELTS
Dodge Mfg. Corp.
Goodrich, B. F., Company, Inc.

VALVES
Airmatic Valve, Inc.
The Bagley & Sewall Company
Crane Company
DeZurik Shower Co.
Dilts Machine Works
Downingtown Mfg. Co.
Grinnell Company
E. D. Jones & Sons Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
Ohio Injector Co.
Powell Valves
Record Fdy. & Mch. Co.
Rockwell Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.
Walworth Company

VAPOR BARRIER COATINGS
Insul-Mastic Corp. of America

VATS
Beloit Iron Works
Biggs Boiler Works Co.
Black-Clawson Co.
Downingtown Mfg. Co.
Mahon, R. C., Co.
Moore & White Co.
Sandy Hill Iron & Brass Works

VIBRATORS
Cleveland Vibrator Co.

WASHERS
The Bagley & Sewall Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Improved Machinery Inc.
Jackson & Church Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

WASTE TREATING EQUIPMENT
Hungerford & Terry, Inc.
Jeffrey Mfg. Co.
Link Belt Co.
Ronningen-Petter Co.
Walker Process Equipment, Inc.

WATER CONDITIONING
American Cyanamid Co., Industrial Chem. Div.
Calgon, Inc.
General Dyestuff Corp.
Hungerford & Terry, Inc.
National Aluminate Corp.
Palmer Filter Equipt. Co.
Ronningen-Petter Co.
The Sandy Hill Iron & Brass Works
Walker Process Equipment, Inc.

WATER DISPERSIONS
American Cyanamid Company, Industrial Chemicals Division
Naugatuck Chemical Division of U. S. Rubber Co.
Rohm & Haas Company

WATER FILTERS
Bird Machine Co.
Holyoke Machine Co.
Hungerford & Terry, Inc.
Improved Machinery Inc.
Ronningen-Petter Co.
Sandy Hill Iron & Brass Works
Walker Process Equipment, Inc.

WATER PENETRATION TESTER
Testing Machines, Inc.
Thwing-Albert Instrument Co.

WATER SOFTENERS
Antara Chemicals Division, General Dyestuff Corp.
Hungerford & Terry, Inc.
Wyandotte Chemicals Corp., Michigan Alkali Div.

WATER TREATING EQUIPMENT
Hungerford & Terry, Inc.
Ronningen-Petter Co.
Walker Process Equipment, Inc.

WATER VAPOR CUPS
Testing Machines, Inc.
Thwing-Albert Instrument Co.

WATER WHEELS
James Leffel Co.

WAXING MACHINERY
Black-Clawson Company
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Hudson Sharp Machine Co.
The Mayer Machine Co.
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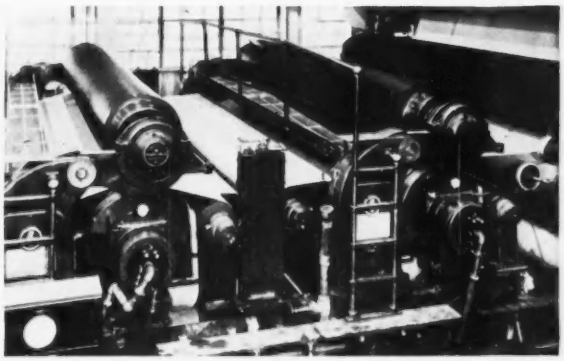

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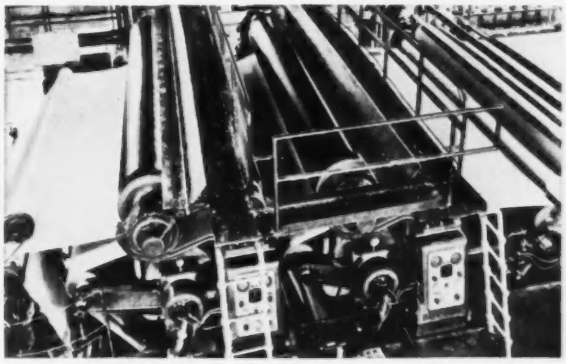

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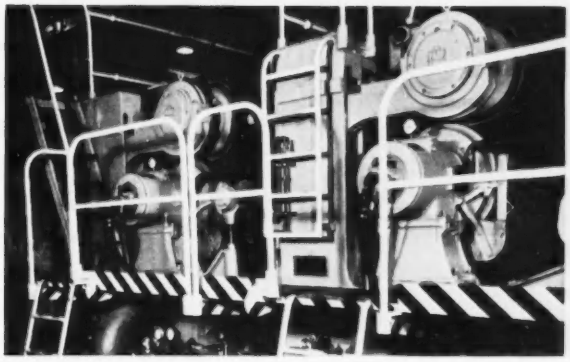

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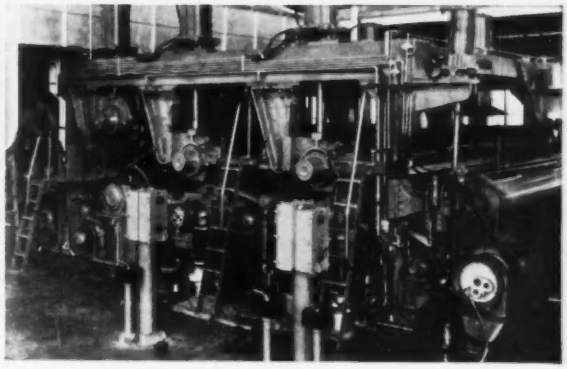

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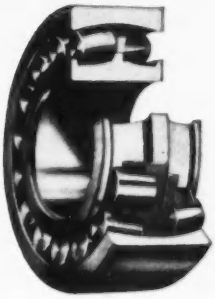

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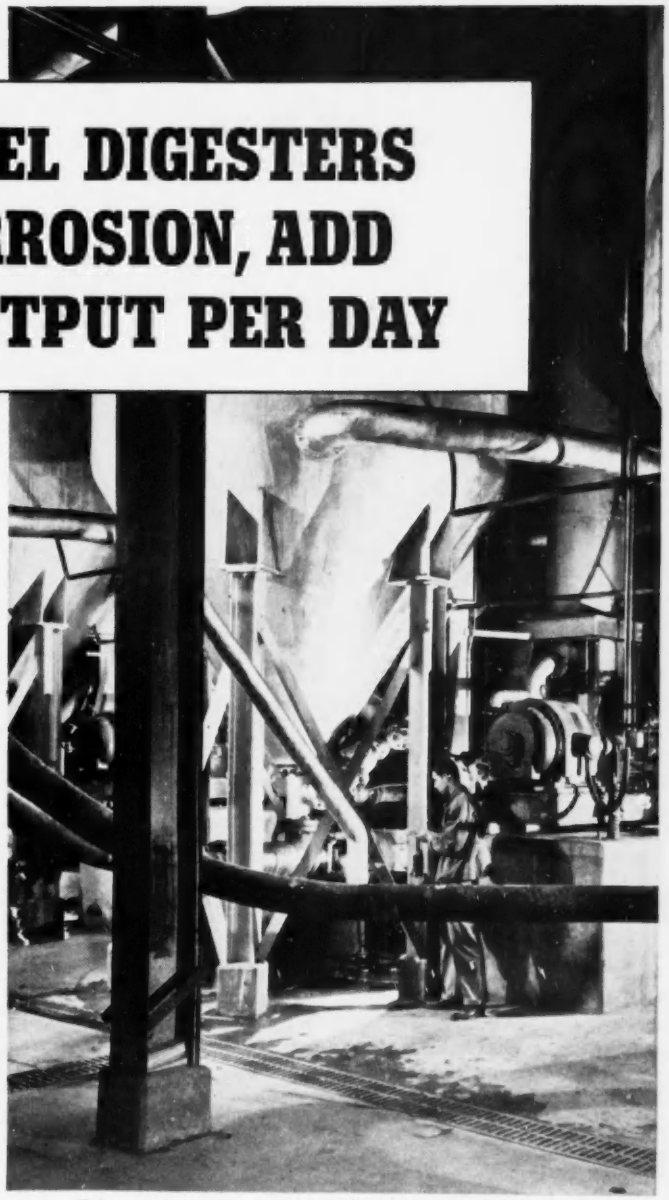

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